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Water Purifier for Steam Boilers.

The accompanying engravings represent the apparatus for depositing the mineral and other matter contained in water, for which a patent was granted to Gustavus Weissenborn, of this city, on the 16th of January last.

Fig. 1 is a longitudinal vertical section of the apparatus. Fig. 2 is a horizontal section through the large cylinder, A B, and fig. 3 is a plan view of the spiral exhaust chamber. The nature of the invention consists in the method of depositing mineral or other foreign matter held in solution in water, by heating the hard water by steam, and causing it to trickle or flow over an extensive surface of stones, twigs, and similar substances, and thus deposit the earthy or mineral substances in the water by the agency of heat, and the great extent of surface over which the water is made to flow.

b, fig. 3, is a pipe for introducing the steam. *e* is a pipe through which the hard water to be purified is injected in fine jets. *ffff* is the spiral channel through which the commingled water and steam pass to the center, 2, where they enter, in a fine shower, into the large cylinder, A B, and through brushwood, H, in fig. 1, between which and the sides of the cylinder, an open space is preserved, by four upright pieces of wood, at equal distances apart, and kept in their position by iron rings, 2'. The heated water flows from the brushwood into a sheet iron case, K, containing horse manure, through which it passes into the nterior cylinder, which is a brass sieve, K', thence to the lower receptacle, which is placed in the ground, and can be made of wood. In this the water ascends from the bottom through pebbles or small stones, L, as shown by the arrows, fig. 1, then falls and rises again through pebbles in separate compartments, from which it passes to the reservoir, and is thence drawn off by a feed pump attached to the pipe, M. C is an exhaust relief pipe; *g* is the cover of the apparatus, and *v* represents a float to regulate the admission of water.

This is a close apparatus, and it will be understood that it is connected with a steam engine, the exhaust steam of which is injected into it, to heat the cold hard water which is admitted through the pipe, *e*, as has been described. The object of it is to deposit all the matter held in solution in hard water, on the brushwood, pebbles, &c., so as to render it pure previous to its being used in the steam boiler, and thus prevent it forming incrustations therein, the very principle recommended some years since in our columns to be employed in the limestone districts of our country for steam boilers, and which Mr. Weissenborn has here ingeniously carried out into practice. The annexed engravings represent an apparatus, designed for Messrs. Stillman Allen, & Co., of the Novelty Works, this city for an engine of about 100-horse power, and is about 2 feet 8 inches in diameter, and 5 feet high, with a tank or reservoir below ground of 5 feet long, 3 feet wide, and 2 feet deep.

The pumps force the hard water into the purifier, and steam from a boiler, or the exhaust steam from the engine is admitted, in sufficient quantity to heat the water to about boiling point. These come in contact in the upper part of the apparatus, at the entrance to a coil of pipe, which may be of 20 to 40 feet in length, and is arranged in the spiral form, to economise space, and afford greater friction than a straight smooth channel. The water is admitted through a sliding strainer, which divides the stream into numerous fine jets, thus insuring a more complete commingling with the steam, the force of which drives it with great velocity through this winding channel; thence it runs to the perforated basin, where it is showered over and trickles through the brush; from this it filters through horse manure, charcoal, or other suitable substances contained in a coarse mat or sack, then falls and rises through the pebbles, L, placed in two or three compartments of the tank, from which it flows freed of its mineral matter, as described, into the reservoir, and thence by the feed pump is conveyed to the boiler. Any surplus steam from the apparatus is carried off to the air, or to a condenser.

At each stage of the process, a portion of the salts contained in the water is set free, and deposited in the purifier, chiefly in the spiral channel, and upon the twigs and stones, or whatever substitutes for them it may be most convenient to use, and also as a muddy precipitate at the bottom.

WEISSENBORN'S PATENT WATER PURIFIER FOR STEAM BOILERS.

Fig. 1

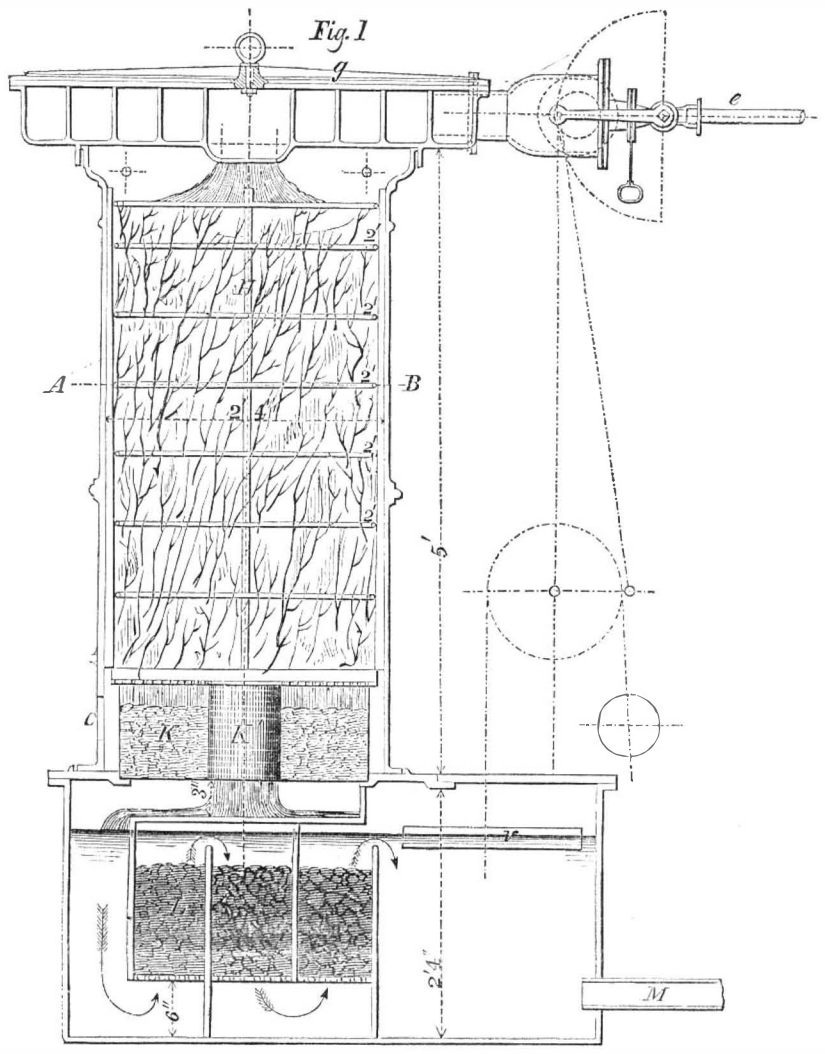

Fig. 3

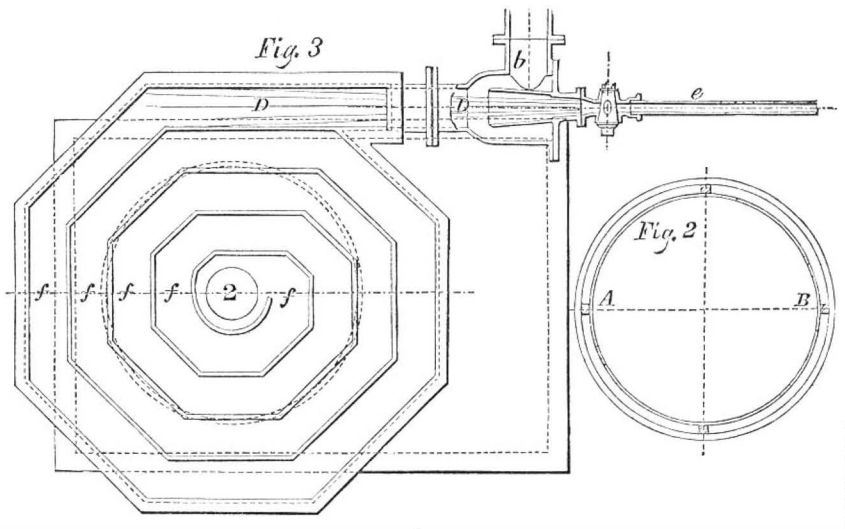

Fig. 2

Due provision is of course made for opening the different parts of the apparatus, to remove the mineral and earthy matter from time to time—about every three or four months, we are told.

The most common incrustations formed in steam boilers are of carbonate and sulphate of lime and magnesia. Heat expels from water its free carbonic acid, without the presence of which the carbonates of lime, &c., are insoluble, consequently, when the acid is expelled, these matters are precipitated. The evaporation of the heated water, causing a concentration of these salts, likewise brings them in excess of the power of the water to hold them in solution, and also tends to the same results—their deposition. This is the philosophy of the process. But these agencies alone are insufficient to effect the separation of all the mineral matter before the water enters the boiler. To complete the process, the violent agitation of the water, its subdivision into small streams, and, in this state, meeting with, and percolating or trickling through, a mass of material presenting a great extent of surfaces for contact; all have to perform their part. As a further security for the desired result, horse manure, charcoal, or other matter, may be used, the object being, by the operation of their chemical affinities, to precipitate any solid matter which may chance still to have remained in solution.

The joint action of these principles purifies the water of its incrusting salts before it comes to be used in the boiler, leaving them deposited in the apparatus, where they are of no detriment.

This Incrustation Preventor requires but little space and attention, and it may be made quite a neat and ornamental attachment to the engine, while its utility as a heater is also self-evident. The impracticability of using the ordinary heaters for hard water, on account of the frequent bursting of the feed pipes from incrustations, renders this apparatus very valuable for some districts in our country. At the same time its services as a condenser are also deserving of attention. The form of this apparatus can be varied to suit the requirements of parties using it. The manifold evils resulting from the formation of incrustations in steam boilers, are well-known to all our readers, and need not be further alluded to at present. An efficient and simple remedy has long been a desideratum. Mr. Weissenborn—who is a mechanical draughtsman and engineer—has devoted much attention to the subject, and has invented this apparatus, and practically tested it. It is now attracting considerable attention in this city, and is here presented so that the public may have an opportunity of judging for themselves of its merits.

More information may be obtained of E. W Sargent, Delmonico's Hotel, Broadway, N. Y.

Saltpeter.

Dr. A. A. Hayes, in a communication to the Boston *Atlas*, suggests a plan by which the present scarcity and high price of saltpeter may be in a great measure obviated. He proposes to import nitrate of soda, which is a natural product, found in the district of Atacama, South Peru. He says, "As the price of nitrate of soda at the port of shipment, is to a large extent made up from the cost of fuel consumed in refining (the country is a desert,) and the expense of transportation, it is apparent to every one, that under judicious arrangement, these charges might be much reduced, and either the crude or refined article delivered at the shipping port, at a cost much less than at present. During the last ten years, the cargo price of nitrate of soda at this port has not much exceeded two-thirds the price of the first quality of saltpeter, and it is now less than half that price. Nitrate of soda, in its dry and pure state, is composed of anhydrous nitric acid 63·53, and anhydrous soda 36·47 parts in a 100. As the nitric acid in 100 parts of saltpeter weighs 53,21, one hundred parts of nitrate of soda should afford nearly one hundred and nineteen parts of saltpeter, by exchanging its soda base for an equivalent of potash. This change can be easily effected by means of salts of potash, when salts of soda are produced on one hand, and saltpeter on the other. Salts of potash abound in wood ashes, and where wood ashes can be obtained, or any salt of potash cheaply, we may at once compete with India in the production of saltpeter for home consumption."

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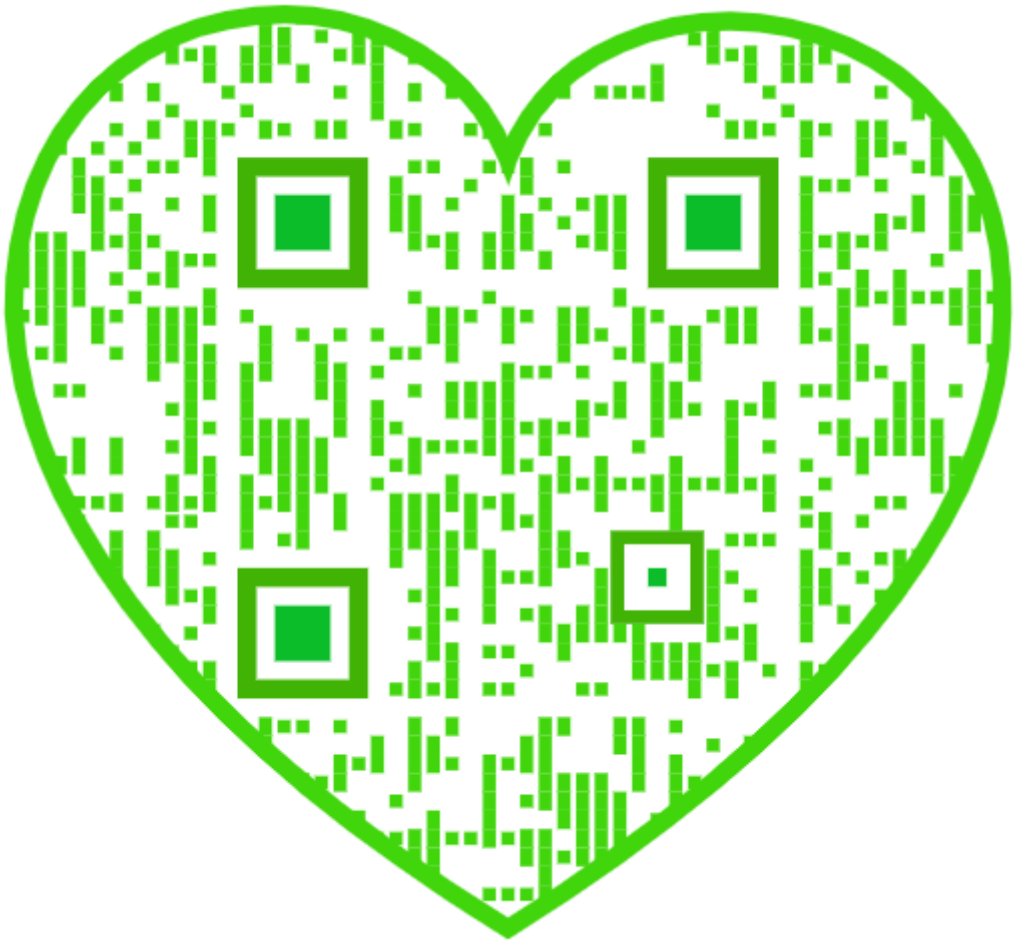

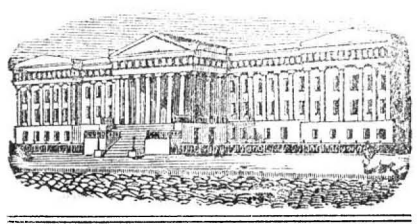

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING DEC. 11, 1855.

BLEACHING IVORY—Wm. M. Welling, of Brooklyn, N. Y., I claim the method described and shown, of bleaching ivory plates, by so placing and sustaining them on their edges, in a suitable case, that the sun's rays shall act with uniform power and bleach said plates equally on both sides, in the manner and as specified, thereby dispensing with the usual method of turning the plates over, to expose, alternately, the flat sides to the action of the light, and preventing warping or damage to the ivory, and accomplishing said bleaching operation in far less time, and more perfectly.

FOLDING AND MEASURING CLOTH—James Baxendale, of Providence, R. I.: I claim, first, the employment of separate rods, b b, b' b', for the several folds of the cloth, the said rods being arranged and operated to fall across the successive layers of the cloth, as they are laid, by the movements of a suitable reciprocating carriage over the folding table, and to remain within the folds till the folding of the whole piece is completed, substantially as set forth.

Second, the manner of operating the said rods, b b, b' b', to throw them from their upright positions, across and upon the cloth, by means of the nut, J J', and the screws, I I', which are actuated by the movements of the reciprocating carriage, substantially as described.

[The cloth passes from a roller on which it is wound through a reciprocating carriage; the latter moves back and forth over a horizontal table which receives the cloth; at each movement of the carriage a hinged rod drops from the machine into the fold made and remains in the crease until the whole piece is finished; there is a rod for each crease; when the piece is all finished it is drawn off from the rods, and the latter thrown back for use again. The machine works with certainty: it is quite simple in its operations and might, we think, be introduced with great success in all establishments where large quantities of goods are to be put up. By the attachment of a registering apparatus the exact length of the cloth folded might be unerringly exhibited. B. B. Babbitt, Esq., of Providence, is assignee of one half of this patent.]

BOOT AND SHOE PEG CUTTERS—H. E. Chapman, of Albany, N. Y.: I claim the making of shoemakers' floats or peg cutters with planing cutters, substantially as the same is set forth and described.

FOUNTAIN INKSTAND—C. T. Close, of New York City. I claim the arrangement and combination, substantially as specified, of the upper tube or passage, b, connecting the top or air space of the reservoir with the pen cup at or immediately below the level the ink is designed to stand in said cup, the latter being connected with the reservoir, in manner shown or equivalently thereto, and the ink in the pen cup, forming a fluid valve, that upon the insertion of the pen, and withdrawal thereof, alternately opens and closes the lower end of the upper connecting tube, for the free, rapid, and certain admission of fresh air, at intervals, in the reservoir, as required.

WATER GAUGES FOR STEAM BOILERS.—Josephus Echols, of Columbus, Ga.: Although I have described the glasses on each side as being attached to nuts in frames, which can be removed, I do not wish to limit myself to this, as glasses on one side may be secured directly to the gauge tube and be got at for the purpose of cleaning, when the glass or glasses are removed on the other side.

Nor do I wish to be understood as limiting myself to the special mode of construction specified, as other equivalent modes may be substituted.

I claim making gauge tubes for indicting the hight of water in steam boilers with an aperture provided with convex glass, presenting the convex or arched surface to the pressure in the tube, substantially as, and for the purpose specified.

GAS APPARATUS—John S. Gallaher, Jr., & John W. Smith, of Washington, D. C.: Disclaiming all and every part of our apparatus taken individually, we claim, solely, the arrangement of the said parts, and specifically of the retort, X, with Hooke's blow-pipe, C, combined with the furnace, a a a a, the water reservoir, b b b, the strainer, K K, the receiver, m m, in the manner as specified, and for the purpose of constituting a compact and portable gas generating and purifying apparatus.

RAILROAD CAR SPRINGS—P. G. Gardiner, of New York City: I claim my improved car spring composed of a coiled plate spring combined with a segmental base, and a movable segmental cap, substantially as set forth.

[This invention consists, first, in a volute spring composed of a flatstrip of metal arranged to receive the force or weight in a direction parallel with the axis of the volute. A weaker spring of any suitable form and materia is introduced into the center of the volute spring, for the purpose of giving a support to both ends of the volute at the same time, and thereby effectually preventing the occurrence of a fracture through any sudden concussion.

The invention consists, secondly, in encasing the volute spring within a double bed, which, while it yields to every movement of the spring, forms an efficient guide to prevent any lateral movement, and also protects the spring from dust. At the late fair at the Crystal Palace, we saw some tests of this invention made, which satisfied us that it was an important and valuable improvement.]

TILE ROOFING—Gottlieb Graessle, of Hamilton, O.: I claim the construction substantially as described, of tile roofing, having each over-lapping edge, a, resting by an angle only, upon the flat subjying surface, b, between the ridges, c d, of the adjacent tile, and having two transverse ridges, e f, on the top of each tile, enclosed by similar ridges, g h, projecting from the superjacent under surfaces of the tier next above, for the purposes explained.

RAKING AND LOADING HAY—John K. Harris, of Allensville, Ind.: I do not claim any form of attachment to the wagon, or the manner of forming the spring of the rake teeth, or any continued endless belt motion, with an ordinary rake attached behind, to save the hay, passed over by the endless belt elevator.

But I claim, in combination with the rake, for the purpose of taking the hay from the rake in regular successive intervals of time, and in separate parcels, and elevating and delivering it on the wagon, substantially in the manner and for the purpose as described.

BEDSTEADS—Benjn. Hinkley, of Troy, N. Y.: I do not claim the cross springs as a means of support.

But I claim the cross bars, whether springs or not, for the support of a bedstead frame, when the same are mounted upon a pedestal and stand, as set forth.

ATTACHING EXTINGUISHERS TO LAMPS—F. A. Jewett, of Abington, Mass.: I claim attaching the cap or extinguisher to the lamp by means of a spiral spring, coiled around the wick tube, and secured at one end to the cap, and at the other to the screw plate, c, or in any other convenient locality, whereby the cap is tightly drawn down over the wick, as described.

LOCKS FOR FREIGHT CARS—Henry C. Jones, of Newark, N. J.: I claim combining with the double jaw spring bolts of a lock, and with the levers, by which the jaws are opened, by the action of the key, as specified, a stop tumbler, substantially such as described, operated by the key, after the jaw bolts have been opened, to hold and keep them apart, after the key is taken out of the lock, that the lock may be employed as a stop or dead bolt lock, as specified.

IMPACT WATER WHEEL—Athison Queal, of Plymouth, N. Y.: I claim the sliding buckets, H H, placed on the head, D, of the wheel, and operated by the inclined semicircular rod, J, in combination with the partition, L, arranged as shown and described.

I further claim attaching the wheel, C, to the shaft, G, by means of the pins, c c, fitting in the hub, h, the pins being attached to a ball, d, on the shaft, for the purpose set forth.

[The above is a horizontal water wheel, the buckets of which are movable, being made to rise and fall, alternately, on the reception and discharge of the water. The novel feature consists in the peculiar method of causing the buckets to move instantly and at the proper moment. An engraving would be required to exhibit the moving parts correctly. The inventor states that in this wheel the full force of the water is brought against the buckets suddenly, at the right time, without any back pressure, and that the force is continued until the moment of discharge. The exit of the water, which is permitted by the raising of the buckets, is free and quick, without any drag. It is believed that the wheel will afford a greater per centage of power than any other of its class. Its construction is not expensive.]

CORN SHELLERS—James J. Johnston, of Alleghany City, Pa.: I claim the secondary cleaners or pickers, f, revolved around the cob, as the cob is projected by the main cylinder, c, through the opening in the case, a, of the machine, substantially in the manner and for the purpose described.

SAND PAPER MAKING MACHINES—Gilbert D. Jones, of Jersey City, N. J.: I claim, first, applying the sand or grit in a heated state, to the glued surface of the paper, for the purpose set forth.

Second, the method of depositing the sand upon the glued surface, that is to say by projecting it forcibly against said surface, while in such reversed position that the excess shall fall off by gravity, as described.

Third, the combination of the stationary pieces, o, or their equivalent, with the moving drum, the paper, and the glueing roller, for the purpose set forth.

CUTTING OUT, PUNCHING, AND STAMPING THE SOLES AND HEELS OF BOOTS AND SHOES—Jean Pierre Molliere, of Lyons, France. Patented in France, July 22, 1853: I claim the cutting out of soles and heels by the blades, a a and b b, from strips of hammered or other leather, sliding between the guide pieces, r r, and held in place by the stoppers, x x, the pricking and stamping of the heels and soles, so cut out by the awls, d, and the stamp, e, at the same time, the three operations being performed at one stroke, the detaching from the blades and awls of the pieces cut out, pricked, and stamped, by the detaching rods, m m and o, and the adjustment of the eccentrics upon the shaft, L, in such manner that two of the punchers can operate at one and the same time, the whole constructed and operated substantially as described.

PROCESSES FOR CALICO PRINTING—Robt. Prince, of Lowell, Mass., and Ambrose Lovis, of Boston, Mass.: We are aware that pure silicate of soda alone, or with pure carbonate of soda, has been used heretofore in dunging; and we are also aware that silicate of lime has been used for the same purpose. We disclaim the use of these substances. Confining ourselves to the use of the silicate, in mixture with neutral and alkaline salts.

We claim the manufacture of silicate of soda, or potash containing foreign neutral salts, and the use of this compound with carbonate of soda and neutral salts, in dunging operations, substantially as set forth.

SAWING MARBLE, &c., IN TAPER FORM—Geo. T. Pearsall, of Apalachin, N. Y.: I do not claim the adjustable bars, H, irrespective of the mode of operating them; nor do I claim the laterally moving saws placed within a reciprocating saw frame, for they have been previously used.

But I claim the employment or use of the levers, C K, the levers, K, being connected to the sockets, I, of the bars, H, and the uprights, f, of the framing, A, and the levers, G, being attached to the frame, B, and the framing, A, substantially as shown, for the purpose specified.

[The nature of this invention consists in the employment of cross levers attached to the saw frame guides, and also to the horizontal frame on which the saw frame works, for the purpose of causing the saw frame guides to be moved laterally in a perfectly vertical position, and at the same time enabling the horizontal frame to work up and down in a horizontal position. The machine is intended for simultaneously sawing two sides of a block of marble on a taper.]

BUCKLES—Sheldon S. Hartshorn, of Orange, Conn.: I claim constructing the tongue, s, and loop of the buckle in one part, and at one operation, in such a manner that the socket, a fig. 3, will firmly secure the joint. b, in the other part, fig. 2, so as to need no other fastening, as described.

MOSQUITO CURTAINS—John S. Martin, of Boston, Mass.: I claim the mosquito curtain, as made of two bars, a sheet of cloth or netting, and a series of elastic bands, arranged and applied, and so as to operate together, substantially as set forth.

ADJUSTING CIRCULAR SAWS OBLIQUELY TO THEIR SHAFTS—Amos D. Highfield, of Philadelphia, Pa., assignor to himself and Wm. H. Harrison, of same place: I do not desire to claim the exclusive use of oblique circular saws for cutting grooves, as such are well known.

But I claim the employment of two beveled washers between a fixed collar on the spindle and the circular saw, in the manner and for the purpose specified.

CORN SHELLERS—J. P. Smith, of Hummelstown, Pa.: I claim the construction of the frustums, D and C, with their winding wings, d d, upon both and cross projections, c c, upon one, substantially in the manner and for the purposes set forth.

CARVING WOOD, &c.—I. M. Singer, of New York City: I do not limit myself to the special construction or arrangement of parts specified, as these may be varied without changing the mode of operation of my invention.

I do not claim the combination of the tracer with the tracer which carries the block of wood to be carved, by means of one system of pentagraph levers, as this is described in a patent granted me on the 10th day of April, 1849.

But I claim combining the tracer with the table which carries the block of wood to be carved, by means of two systems of pentagraph levers operating at right angles with each other, substantially as described, whereby the block to be carved will be directed and presented to the action of the cutter, in such manner as to determine the configuration as well in a vertical as in a horizontal direction, as set forth.

SLIDE VALVES FOR STEAM ENGINES—E. D. Leavitt, Jr., of Lowell, Mass.: I claim making the valve and the corresponding parts of the steam chest, between which it works, of tapering form laterally, and fitting the valve to its rod, in such a manner as to be capable of lateral movement, substantially as described; whereby the valve is always kept tight between the seat and the back of the steam chest, by the pressure of the steam, and the wearing of the rubbing surfaces is always compensated for.

[In carrying out this invention the back of the valve is fitted to the cover of the steam chest, between which and its seat it works steam tight. The improvement consists in a certain method of compensating for the wear of the valve and the two faces between which it works. There is an arrangement whereby the valve is more perfectly balanced than by the ordinary method. The valve is made tapering in a transverse direction, but in a longitudinal direction its two faces are parallel. By thus tapering the valve, one of its sides is caused to have a greater area than the other, and the steam, by exerting a greater pressure on the larger area, tends to force the valve between the faces in which it moves, and thus keeps it always tight. It is a good improvement.]

MANUFACTURE OF CANNON.—Daniel Treadwell, of London, Eng.: I do not claim using hoops generally, in making cannon, as the earliest cannon known were formed, in part, by hoops brazed upon them.

But my invention consists in constructing cannon with hoops around, and shrunk upon a body, in which the caliber is formed, in the manner described

CARRIAGE HUBS—S. W. Reed, of Berkshire, N. Y.: I am aware that a loose disk brace, or flange, has been used to support the spokes of a wheel, mounted on and supported between the two flanges of a hub, and having recesses to receive the forked tenon of a spoke, formed by a saw cut, into which the disk is fitted; such a hub I do not claim, as that has been patented by J. B. Haydon.

But I claim the arrangement of the dodged mortises, D, formed on both sides of the permanent projecting flange or brace, C, by the triangularly-shaped projections, A, radiating from the tube, B, for the reception of the spoke tenon, S, where by a double row of spokes may be inserted in the hub, and supported by the flange, C, in combination with the nuts, H, to tighten or lock the spokes, and by which a broken or worn-out spoke may be removed and a new one inserted in its place, without untiring the wheel, as described.

CUTTING ARTICLES FROM LEATHER—Chas. Rice, of Boston, Mass., and S. H. Whorf, of Roxbury, Mass.: We lay no claim to any of the devices or combinations contained in the machines described in patents Nos. 6,055 and 12,128.

But we claim combining the cutting die with the platen by means of a rotary and adjustable plate, L, in combination with so applying the pack clamp to its pitman, that it may turn thereon when the die or cutter is revolved in the manner and for the purpose as specified.

We also claim the described arrangement of the operative mechanism of the pack clamp, and that by which the cutter is either depressed or elevated.

AUGER HANDLES—Guillaume Henri Talbot, of Boston, Mass. Patented in England Aug. 25, 1855: I do not claim the manner described of giving a revolving action, in either direction, to the auger bit, or boring tool, by reversible pawls and ratchets, operating in connection with a vibrating handle apart from the relative arrangement and form of handle specified, as such is common to drill stocks.

But I claim in gimlet or auger handles, the arrangement substantially as specified, within the body of the said handle, which crosses the bit of the ratchets, a b, and pawls, a' b', with their reversing gear, for operation of the bit, or bit socket, in either direction, either by a revolving or vibratory action of the gimlet handle, on pressure of the hand, applied on both sides of the axial line of the bit and under the usual clutch of the hand on the handle over the center line of the bit, and whereby the actuating pawls, ratchets, and accompanying devices, form no obstruction, and protected from injury or derangement, essentially as set forth.

[In this improvement there is a double ratchet movement, contained within the handle of the tool, which enables the operator to revolve the gimblet without removing his hand from the handle. In confined places, where there is not room for turning the handle, and, indeed, in all places and positions this improvement will be found very convenient. There is a reversing catch, by pressing which the direction in which the tool turns is changed. All the moving parts are contained within the handle, which, in external appearance is the same as those in ordinary use. The invention is applicable to augers, screw drivers, and a variety of tools. Patented in the United States and Europe through the SCIENTIFIC AMERICAN Patent Agency.]

CHAIN MAKING MACHINES—Edward Weissenborn, of New York City; I claim, first, the employment for welding the rings of two rollers, grooved spirally in opposite directions, and operating substantially as described.

Second, arranging one of the end bearings, K', of one of the spirally grooved welding rollers, so as to be capable of sliding lengthwise to the roller, substantially as described, far enough to allow the ring to be shipped over the end of the roller.

Third, the manner described of raising, depressing and confining the upper roller, to allow the ring to be slipped over the lower roller, to wit, by means of the rods, n' n', the yoke, N, the spring, n n, and the cam shaft, P, with the cams, n'' n'', the whole being arranged and operating substantially as set forth.

Fourth, the traveling box, R, operating substantially as described, to carry the rings quickly over the end of, and up to the back end of the welding roller, L, and to come back with the ring, at a speed properly corresponding with the velocity of the rollers and pitch of the spiral grooves.

Fifth, I claim the carrier, x, operating substantially as described, first, to move forward to receive the ring in its fork, then moving quickly upwards, to snatch the ring from the box, and afterwards dragging the ring along the plate, which contains the elongating mechanism, till it comes in contact with one of the elongating posts, or its equivalent, as is thereby taken from the fork of the carrier.

Sixth, the combination of the movable parts, v v', and side dies, w w, operating substantially as described, to elongate the ring, and at the same time close or drive towards each other the elongating sides.

Seventh, the arrangement of the dies, w' w', round which the link is bent or doubled, substantially as described relatively to the dies, w w, by which the elongated sides of the link are forced towards each other, and their attachment to the same, whereby, when the link has received the form shown in fig. 8, it is caused to be in readiness to be bent or doubled by the action of the hooks, V V, or other equivalent.

Eighth, Operating the posts, v v', by which the elongation of the wing is performed, by means of a wedge or double inclined piece, 21, attached to one of the side dies, w', acting upon studs, 22, attached to the slides which carry the said posts, whereby the approach of the side dies towards each other, and retreat of the posts from each other, are effected simultaneously.

Ninth, the suspension of the bending hooks at their pivot, z, and application of a spring to draw their points apart, substantially as described, so that the said hooks will descend in an open state, and will be in condition to receive the link, when the latter is sufficiently elongated, but that in ascending and drawing up the ends of the link they will gradually close, as required by the changing form of the link.

[The chain made by this machine is not like that in common use, but is of a peculiar kind, which may be called "double link chain;" it is made, not of pairs of links, but strictly of double links, each consisting of only one piece of metal. The links are faggoted and welded before being put into the chain, and to make them enclose each other, only require to be bent. It is in a great measure owing to the manner of making the links which gives this chain the superiority which it is claimed to possess over the common kind of chain. This machine performs the whole of the process of making the chain from the forging of the links to putting them together. The first operation which takes place at one end of the machine, is that of winding up a small piece of small flat iron rod till it forms a coil of several thicknesses of metal This coil is taken to a proper fire and heated to a welding heat, and then put in another part of the machine, by which it is welded into a ring which is equally strong at all points. From the last-named part of the machine the ring is taken by automatic devices to another part, where it is elongated in one direction and closed in a direction at right angles to it, till it forms a link which resembles the figure 8, except that the two sides do not cross in the middle. It is then taken by other devices and bent at the middle of its length, and then, by hand, put through another link and placed in another part of the machine, by which its looped extremities are drawn close together, which finishes it. The next link passing through these looped ends secures them, and thus the chain is formed All the operations are performed with great rapidity. The invention is regarded as one of great value and importance. American and European patents have been secured through the Scientific American Agency.]

EMBOSSED LEATHER—Israel Amies, of Philadelphia, Pa.: I wish it to be understood that although I have described one particular process of treating veneers, before my improved art of embossing is practiced thereon, I do not desire to confine myself to that process in every minutia, as the same may be modified, or equivalents substituted.

But I claim the employment of embossing veneers, in the construction of furniture, and for other ornamental purposes, in the manner set forth.

PIANOFORTE ACTION—Francis Taylor, of New York City: I do not claim the button, m, taking the second knuckle of the hammer butt, as this has been used as an attachment to the key.

But I am not aware that this button, m, has ever before been made as a permanent attachment to and moving with the fly of the jack, in the manner, and as specified, whereby the fly of the jack is held to the knuckle, 3, by the button, m, until the hammer is sufficiently raised for said button, m, to clear the knuckle, 2, and also replaces the said fly of the jack beneath said knuckle, 3, immediately that the key is released and the hammer descends but a short distance, producing an instantaneous and uniform repeating action.

Therefore, I claim the regulating button, m, permanently connected to moving with and governing the fly of the jack, in its action on the butt of the hammer, the whole arranged and operating substantially as specified.

PACKING PISTONS FOR STEAM ENGINES—Joel W. Pettis, of Hillsdale, Mich.: I do not claim the forcing out of the packing by means of radial arms within the piston, when the said arms have only a sliding rectilinear movement produced by cones at the center, as such have heretofore been used, and I consider that arrangement inferior to, or more likely to get out of order than, and not so easily adjusted, as the arrangement of the arms to work, as described.

But I claim the arrangement and application of the arms, F F, substantially as described, between the packing rings and a movable center bearing, whether the said center bearing be movable, to adjust or tighten the packing by means of a central rod passing through a hollow rod, or by other means.

[Mr. Pettis' improvement is intended to enable the engineer to tighten the packing of the piston, without going to the trouble of removing the cylinder head and various other appurtenances. This is done by making the piston rod hollow and passing a solid rod down its center to the piston head. The packing is metallic; within the head are four arms, connected by joints at one end with the packing, and at the other with the central rod before named; by raising or lowering the rod the packing will be loosened or tightened; the engineer, therefore, when he desires to move the packing, merely turns a nut at the top of the piston rod. The advantages of this improvement are obvious.]

CUTTING CLOAKS—A. S. Thompson, of Albion, Pa.: I claim cutting a cloak from a seamless cloth, without sleeves, but so that by making four cuts of the proper length for the sleeves, the cloak may be worn as a sleeved sack or overcoat, by merely changing the buttonings, substantially in the manner described.

HARVESTER RAKERS—John W. Haggard & Geo. Bull, of Bloomington, Ill., assignors to Bull, Haggard, & Newsteter, of same place: We claim the plate o, having its inclined and parallel planes on the same sides, in combination with the pin, z, bar, J, spring, l, and pin, R, the whole being constructed, arranged, and operating as described.

ROTARY PUMPS—C. D. Wright, of Fort Atkinson, Wis.: I claim the construction of the pump as shown, viz., having the hollow sphere, C, placed within an inclined or oblique shell, B, which forms the body of the pump, the sphere being attached to a hollow shaft, E, at one side, and communicating with a section pipe, A, at its opposite side, two opposite sides of the sphere fitting in concaves, a, in the side of the shell, the sphere being also divided into two compartments, b c, one of which, c, communicates with the suction pipe, A, and the other, b, with the force pipe or hollow shell, E, the sphere having a flanch, D, attached to it, which divides the shell or body, B, into two compartments, e f, and the flanch having a piston, G, working in it, at each side of which, apertures, B, are made in the sphere, C, the above parts being arranged substantially as shown, and for the purposes specified.

[In this improvement a hollow sphere having two compartments is fitted within a shell placed in an oblique position, the shell being attached to a hollow shaft, which serves as a suction pipe, the sphere also attached to another hollow shaft, which serves as an exit pipe. The sphere has a flanch around it; which divides the shell into two compartments, and the flanch is provided with a piston operating in such a manner that as the hollow sphere rotates, the water is drawn through the suction pipe into one compartment of the sphere and forced into the other compartment, and through the exit pipe. The pump operates with but little friction, is simple, and may be cheaply manufactured.]

RUBBING TYPES.—Daniel Moore, of Brooklyn, N. Y., assignor to Geo. S. Cameron, of Charleston, S. C., James H. McWilliams, of New York City, and Daniel Moore, aforesaid: I claim, first, constructing the slice, i, with openings to receive the type at such an angle, relatively, with the direction which said slices move, that the cutters shall commence to act at the latter end of the type, carried by said slices and that the cutting operation shall tend to force the type into the bottom of said angle and thereby retain the type in place in said slice in the manner and for the purposes specified.

Second, I claim constructing the slice, i, in such a manner, as at v, that the power to force the type in an endways direction, or nearly so, through the cutters, shall be applied to, or near the middle of the bottom end of the type, in the manner and as specified.

Third, I claim the follower of slides, 8, and holding plate, 9, to supply the machine with a line of type, in the manner, and as specified.

Fourth, I claim the lifter, 12, combined with the gauge fingers, t, and end of the plate, 9, or other stop, for the purpose of elevating one type at a time, to be taken by the slices as specified.

VARIABLE CUT-OFF GEAR FOR STEAM ENGINES—Wm. W. Wade, of Springfield, Mass., assignor to Wade & Burnham, of same place: I claim the arrangement of the induction and cut-off cams upon two parallel shafts, to operate in a yoke frame containing two separate yokes, one before the other, substantially as described.

[This invention consists in certain improved mechanism by which such a movement may be given to a common single slide valve as to make it cut off the steam at any point, from one-eighth to seven-eighths of the stroke. It is a very good improvement, and reflects credit on the inventor. Without drawings its parts cannot be well described.]

RE-ISSUES.

MORTISING MACHINES—Jos. Guild, of Cincinnati, O., Patented originally Nov. 30, 1852: I claim, first, the sliding wrist, o, connected with the chisel, and also with the driving power, in the manner described, in combination with the mechanism described, or its equivalent for sliding said wrist, so that the operator can, during the motion of the machine, vary the depth of cut of the chisel, or cause it to be suspended without disconnecting the driving power.

Secondly, the combination in a mortising machine, substantially as described, of treadle and opposing spring, or weight, connected to a toggle, one end of which being pivoted to the frame, the other is pivoted to a sliding wrist upon a vibrating arm actuated by the power, the said wrist being slid out and in upon the arm with varying power and speed by the action of said toggle and its attached weight, or spring, and treadle, as explained, or their equivalents.

REAPING AND MOWING MACHINES—Saml. Rockafellow, of Coatsville, Pa. Patented July 3, 1855: I claim raising and depressing the finger bar, K, and consequently the cutter, e f, by means of the vertical bars, M M, having wheels, o o, at their lower ends, arm, P, attached to the cross piece, N, of the bars, M M, lever, Q, and shaft, R, with its arm, S, attached, the above parts being arranged substantially as shown and described.

I also claim supporting the ends of the stationary cutters, e, by means of the sockets or their equivalents in the knobs or projections, d, of the fingers, c, substantially, and for the purpose set forth and described.

DESIGNS.

PARLOR STOVES—Conrad Harris & Paul W. Zoiner, of Cincinnati, O.: Design for wood stove named "Parlor Gem."

CLOCK FRAMES—Jonathan C. Brown, of Bristol, Conn.: I claim the combination of the octagon form with the oval corner, as distinguished from some other form.

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PARLOR STOVES—Conrad Harris & Paul W. Zoiner, of Cincinnati, O. : Design for a parlor stove named "Carbon."

SIX PLATE BOX STOVES—Conrad Harris & Paul W. Zoiner, of Cincinnati, O.

COOKING STOVE—Conrad Harris & Paul W. Zoiner, of Cinoinnati, O. Design named "Kanzas."

STRAP HINGES—Enoch Woolman, of Damascoville, O.

NOTE—About one-third of all the American patents granted last week were obtained through the Scientific American Patent Agency. Several of the grants are for inventions of a very valuable and important nature, from which rapid fortunes will be made. To those who are longing to elevate themselves in the world, pecuniarily, we say invent, invent, invent! There is not a surer way to business and fortune for individuals who are without capital, than patents. A good invention generally yields a cash return, and is often of more value than a California gold mine.

The present is an unusually favorable time for applying for patents. The Hon. Charles Mason is again in power, and the business of the Patent Office is being once more conducted with promptness and vigor. Applicants will not have to wait so long as formerly, before the result of their cases is made known.

Prince Albert on Science and Common Sense.

On the 22d of last month, at the laying of the corner-stone of the new edifice of the Birmingham Institute, England, Prince Albert—who was present, and whose health was drank at the dinner given on the occasion—made a speech, in which he, very sensibly, never alluded to the war, nor to political matters, but exclusively to the objects for which the building was designed, namely, scientific instruction. He said it was a pleasure for him to participate in a work of worldly wisdom in that great town, because it was one of the first public acknowledgments of a principle daily forcing its way among the people of Britain, and destined to play an important part in its future developement (and the world in general,) viz., the introduction of science and art as the conscious regulators of human industry. The following short extracts from his speech are worthy of being engraved in letters of gold :

"In all our operations, whether agricultural or manufacturing, it is not we who operate, but the laws of nature, which we have set in operation. It is, then, of the highest importance that we should know these laws, in order to know what we are about, and the reason why certain things are, which occur daily under our hands, and what course we are to pursue in regard to them. Without such knowledge we merely go on to do things just as our fathers did, and for no better reason than because they did so—or improve upon certain processes by an experience hardly earned and dearly bought, and which, after all, can only embrace a comparatively short space of time, and a small number of experiments. From none of these causes can we hope for much progress ; for the mind however ingenious, has no materials to work with, and remains in presence of phenomena, the cause of which are hidden from it. . . . . .

But these laws of nature—these Divine laws—are capable of being discovered and understood, and of being taught and made our own. This is the task of science; and while science discovers and teaches these laws, art teaches their application. No pursuit is, therefore, too insignificant not to be capable of becoming the subject both of a science and and art. . . . . .

No human pursuits make any material progress until science be brought to bear upon them. We have seen many of them slumber for centuries ; but from the moment that science has touched them with her magic wand, they have sprung forward and taken strides which amaze and almost awe the beholder. Look at the transformation which has gone on around us since the laws of gravitation, electricity, magnetism, and the expansive power of heat have become known to us! It has altered our whole state of existence—one might say the whole face of the globe! We owe this to science, and science alone ; and she has other treasures in store for us, if we will but call her to our assistance. It is sometimes objected by the ignorant that science is uncertain and changeable ; and they point to the many exploded theories which have been superseded by others, as a proof that the present knowledge may be also unsound, and after all not worth having. But they are not aware that while they think to cast blame upon science, they bestow, in fact, the highest praise upon her. For that is precisely the difference between science and prejudice; that the latter keeps stubbornly to its position, whether disproved or not, while the former is an unarrestable movement toward the fountain of truth—caring little for cherished authorities or sentiments, but continually progressing—feeling no false shame at her shortcomings, but, on the contrary, the highest pleasure when freed from an error, at having advanced another step towards the attainment of Divine truth. . .

We also hear, not unfrequently, science and practice, scientific knowledge and common sense, contrasted as antagonistic. A strange error! For science is eminently practical, and must be so, as she sees and knows what she is doing; while mere common practice is condemned to work in the dark, applying natural ingenuity to unknown powers, to obtain a known result. Far be it from me to undervalue the creative power of genius, or to trea rewd common wose as thousenwihle ttrss st knowledge. But nobody will tell me that the same genius would not take an incomparably higher flight if supplied with all the means which knowledge can impart, or that common sense does not become only truly powerful when in possession of the materials upon which judgment is to be exercised. . . . . .

No pursuit is too insignificant not to be capable of becoming the subjects both of a science and an art. The fine arts, as far as they relate to painting and sculpture (which are sometimes confounded with art in general,) rest on the applicatiou of the laws of form and labor, and what may be called the science of the beautiful. They do not rest on any arbitrary theory on the modes of producing pleasurable emotions, but follow fixed laws, more difficult, perhaps, to seize than those regulating the material world, because belonging partly to the sphere of the ideal and our spiritual essence, yet perfectly appreciable and teachable, both abstractly and historically, from the works of different ages and nations." (Cheers.)

Recent Foreign Inventions.

JOINING SLABS OF SHEET-IRON—A patent has been granted to Mr. Bertram, a practical engineer, employed in Woolwich Dockyard, Eng., as foreman. His invention consists of a process of firmly joining together slabs of sheet-iron work for the purpose of making boilers, building ships, and erecting bridges, &c., without the use of rivets. This novel method of welding the iron instead of joining it by the rough means hitherto in use—that of riveting—is carried out by fusing the two edges of the plates to be adhered, and striking them simultaneously on both sides. By this means the structure is rendered materially lighter, and much stronger. Some experiments have been tested by order of the Lords of the Admiralty, in presence of the officers of the Dockyard, who are authorized to report thereon. The result of their deliberations will shortly be made known. It has been hitherto considered impossible to make an unlimited surface of iron ; hence the system of riveting has been so far perpetuated.

A NEW EXPANSIVE VALVE MOTION FOR STEAM ENGINES was lately described at the Institution of Mechanical Engineers, by Mr. G. M. Miller, of Dublin. In this motion a single eccentric only is used on the driving axle ; this works the rod of one of the valves direct, and the rod of the second valve is worked by the eccentric through the intervention of a loose ring on the driving axle, having two arms projecting at right angles to each other, to one of which the second valve-rod is attached, the other arm being connected with the eccentric. By this means a similar motion is given to both valves, but corresponding to the relative positions of the two cranks at right angles to each other. The eccentric is molded upon a transverse slide, which is capable of being moved backwards and forwards across the axle by means of a handle, answering to the ordinary reversing handle or lever, and acting through the medium of a pair of racks and pinions. By moving the transverse slides the throw of the eccentric is altered or reversed, thereby enabling the engine to be worked expansively or reversed. A model of the new motion was exhibited, showing it as applied to a locomotive engine; and the particulars were given of the successful working of the new motion in two engines upon the Great Southern and Western Railway of Ireland.—[Railway Gazette, London.

STEAM ENGINES—Mr. T. W. Bunning, C. E., of Nowcastle-on-Tyne, has patented some improvements in steam engines, which consist of an arrangement of trunk-engines in which the steam from the boiler is only admitted under the piston to perform the up-stroke, while it is made to enter through a slide of a particular construction into the upper part of the cylinder, there to work expansively and perform the down-stroke.

FURNACES—T. R. Crampton, C. E., of London, has patented an improvement in locomotive and other boiler furnaces, which consists in employing a series of flat bars arranged transversely in a furnace of a steam boiler, one bar below another, and somewhat forward of each other, thus producing a shelving grating, with spaces for the passage of air horizontally between the bars. At the lower part of such series of shelving bars is a series of ordinary fire bars, which receive the well-ignited fuel descending down the shelving bars, and which are so connected with an axis as to allow fire to be dropped upon them when desired.

Bursting of Krupp's Steel and Iron Cannon.

On page 98, in our list of claims of the 27th ult., two of the claims were embraced in a patent granted to Alfred Krupp, of Essen, Prussia. The first was for the manufacture of cannons from solid pieces of steel, and the second was for the surrounding of cannons made of cast steel with cast, or wrought iron, or gun metal.

We have learned, by recent foreign exchanges, that on the 19th of last month, at the Royal Arsenal, Woolwich, England, a number of scientific gentlemen assembled to witness the testing of one of these guns, a 68 pounder, manufactured by Krupp, in Prussia, for Capt. Creuse, royal engineer. It was supposed to be the largest piece of cast steel ever manufactured, and weighed between three and four tuns. The chemise, or outward covering of cast iron brought its weight to nine tuns. The proof charge was 25 lbs. of gunpowder, one wad, and one of the projectiles made by the inventor and intended for service with the gun. This shot was of a conical shape, about two feet in length, weighing 2 cwt., 1 quarter, and 7 lbs. The quantity of powder used was less than the proof charge of an ordinary 68 pounder by 3 pounds. At the first discharge the gun burst, scattering the fragments high into the air. The sensation of the result was very great, as some supposed it capable of resisting any amount of powder. Its declared value was £1500—$7500

Great Steamship Launched.

On the morning of the 10th inst. the new steamship *C. Vanderbilt* was launched from the yard of R. Simonson, at Greenpoint, amid the acclamations of a dense crowd numbering some thousands of persons, some of whom had come from a great distance to witness the descent of this noble vessel into the briny element. The launch was very successful. The vast size of this new leviathan of the deep was not properly appreciated because of her fine lines, until she was about to be towed down to the dock to get on her sheathing. Four tolerable sized "tugs"—two on each side—appeared beside her, like dog-fish beside a whale. The *C. Vanderbilt* is designed for the Atlantic trade between this port and Havre. She is built very strong, and of a capacity amounting to five thousand tuns. Her engines will be of the common over-head beams. They are nearly finished, at the Allaire Works, and are of huge proportions. The *Vanderbilt* is the largest steamship yet launched on our continent

Granite Dust.

A correspondent of the Washington *Intelligencer* says :—"While examining the granite quarries at Northbridge, Mass., a few days since, I had a conversation with the workmen who were dressing out the stone, in reference to the dust that they were rapping off with a flat piece of board from the face of the stone they were hammering. The dust is reduced in the hammering of the stone to an impalpable powder, and will float in the air. I said to them that it would be well to try the vegetating powers of this granite dust in a hill of corn. They replied that it had been used in gardens and on grass lands with great success, and that it was equal to the best manure. The granite rocks may be ground to an impalpable powder and used as a fertilizer. Feldspar, a component of granite, yields potash, and may therefore be supposed to possess extraordinary fertilizing power."

French Single Horizontal Steam Engines.

Wm. Fairbairn, of Manchester, Eng.,—the famous engineer—in his report of the steam engines on exhibition in Paris, states that the horizontal *single* cylinder engine is gaining ground on the double cylinder vertical engine. He attributes this to its being both cheaper and more compact. At one time the great objection to horizontal engines was the excessive unequal wear of the piston upon the lower side of the cylinder ; but owing to the accuracy with which pistons, are now made, the wear and tear upon cylinders is greatly reduced. In France, Mr. Fairbairn states, the consumption of coal per horse power, in the most common steam engines, is very low—only about three pounds, and the makers of them guarantee that they will not exceed that amount. The steam is used at about fifty pounds pressure on the square inch, and is cut off at one-fifth of the stroke, and so far as economy of fuel is concerned they are equal to an engine with two cylinders, the one for high pressure, and the other for expansion—the well known Wolfe principle, which has been held to be the most economical of all. Mr. Fairbairn states that the improvements in French engines, although well known in England have not been carried out to the same extent as in the former country. He therefore awards high praise to the French engineers, and certainly, when we consider the economy of fuel—3 lbs. of coal per horse power an hour—in their engines, we must call upon our own engineers to spur up and use less fuel than they heretofore have been accustomed to do.

English Scientific Journal.

We understand from undoubted sources that a new scientific and mechanical journal is about to be established in London, adopting the SCIENTIFIC AMERICAN as the standard. We are not permitted to announce the names of its projectors, but they are men of enterprise, and occupy high positions in the scientific circles of London, with almost unequalled advantages for a work of this character. So far as we know—and we believe we understand the subject thoroughly—there is not a first-class journal of the kind in London. They are generally monthlies or weeklies, without force or energy, and the opening for a good journal is, no doubt, very encouraging.

Terrible Effects of Conical Balls.

An English surgeon—Mr. Longmore—writing to the London *Daily News* from the Crimea, says :—

"The experience of French practice, as well as our own is, that patients scarcely ever recover with compound fractures of the thigh, caused by rifle shots in the upper part of the limb, whether amputation be performed or not. This has led both the French and ourselves to make some experiments in cutting out some portions of the bone broken and killed by the injury, leaving the limb on; hoping that while one source of irritation is thus removed, and a less severe shock to the frame is caused than by lopping off the whole limb near the hip, nature may in time restore the continuality of the detached ends by throwing out new bones. There have not been sufficient cases to warrant conclusions on the propriety of this proceeding in the thigh. In no previous war has the human frame been shattered by missiles projected with such force as in this, and the conical form in the balls has caused a considerable difference in the kind of fissuring and splitting up of the bones."

Frantz's Wind Mill.

In the description of the Wind Mill in No. 13, SCIENTIFIC AMERICAN, it was stated that Phillips & Tritle were the assignees of the patent. The patent was assigned to Mr. John Phillips solely, by the inventor,—Phillips & Tritle manufacture the Wind Mills.

Fermentation.

French grape juice, which ferments spontaneously in contact with the atmosphere, if put up in a glass jar, free from contact with the air, will not ferment. This was discovered by Gay Lussac.

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New Inventions.

Improvement in Billiard Tables.

The accompanying engravings illustrate an improvement in Billiard Tables, invented by Michael Phelan, No. 39 Chambers St., this city, who has taken measures to secure a patent.

Fig. 1 is a perspective view of the model table and combination cushions, partly showing the improvements—their construction, and the shape of the pocket irons—"jaws"—and sights, and the inventor would take this opportunity of calling the attention of all disciples of the beautiful and scientific game of billiards to the inspection of these diagrams and the brief explanations accompanying them. He feels confident that he has accomplished that which has occupied the attention of billiard table manufacturers, on the one hand, and all scientific players on the other—an improved model for the table, with cushions possessing the requisite elasticity to produce correct angles when played on.

Fig. 2 is a diagram, showing a top view of the bed, cushions, and pockets of a billiard table; this diagram illustrates the angles produced by a "stroke" of equal strength when played on the "combination" cloth and india rubber cushions. The example is, a ball played from the center of the side pocket over line *a* to the point on the opposite cushion with sufficient strength to make it rebound to the side from which it started, and back again. On the combination cushions it will describe the angles marked A A A, on the diagram, which evidently are correct angles, the base of both being equal. But on the india rubber cushions, the ball, if played with the same force, produces angles to correspond with the dotted lines marked B B, and if played with an increased force it will finally return in a direct line parallel with the end cushions, when, if correct angles had been produced, the ball would have returned to the corner pocket opposite to the ball marked *a* at the termination of the line, A.

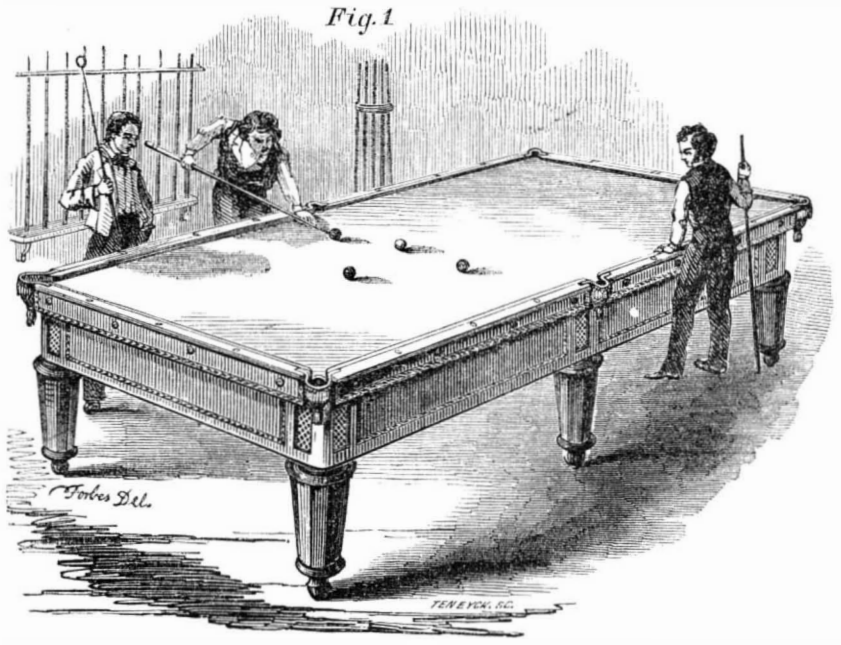
The second example is intended to illustrate the difference of the angles produced by a stroke on the cloth combination and india rubber cushions; play ball *a* against the cushion as represented in diagram, with a moderate degree of strength and the angles produced on the different cushions named will correspond with those lines marked "cloth," "combination," and "india rubber," the cloth cushion will produce an angle too obtuse, the india rubber an angle too acute, while the combination cushion will produce a correct right angle; this can can be proved by actual demonstration on the different tables. For the purpose of illustrating the cause of this, the reader is referred to figs. 4, 5, and 6 which are sectional views of the different cushions named.

Fig. 3 is a view of one corner of the model table, showing the improvements introduced in the shape of pockets, pocket irons, and "sights" or "nails" by which the great inconvenience of the "old school" tables are entirely obviated; also the improvements in the shape of cushions. *a* shows the shape of the jaws. *b* is the cue in a horizontal position, and *c* shows the shape of the jaws in old style. In fig. 4, *a* shows the manner the cue has to be elevated on the old style of cushions; *b* is the sight; *c* the india rubber tube, and *d* the ball. *a*, fig 5, is the cue in a horizontal position. *b* is the sight inserted level with the cushion. *c* exhibits the manner in which the cushion is secured; *e* is the ball.

The combination cushions are half an inch lower than the old style cushions; this is of the greatest importance, for when the ball is at rest close to it, it can be struck and played with almost the same facility as if it were at any other part of the table, enabling the player to play with his cue in nearly a horizontal position, (fig. 5) and not be obliged to elevate it as the cue is represented by *a* in fig. 4. Another improvement is the nails or sights marked *b b*. In the old style (fig. 4) they project above the cushion and interfere with many strokes during the play. In fig. 5 they are inserted in, and level with the surface of the cushion; the pocket irons, also, are level with the surface of the combination cushions, thus allowing the player to strike the ball when in the position represented in fig. 3, with the cue *b* perfectly horizontal. These improvements will be obvious to all good billiard players. The most important, perhaps, of all, is the difference in the shape of the pockets. The dotted lines, *c c*, at each side of the pocket, fig. 3, are intended to show the difference between the shape on the old style, and those on the model tables. By constructing the "jaws" of the

IMPROVED BILLIARD TABLES AND CUSHIONS.

Fig. 1



tables. *c c*, fig. 3, therefore, shows the old style shape of the pocket, and *a* the new style on the combination cushion. There is at least five inches more cushion on each pocket of the new, or thirty inches on the whole. Fig. 4 is a sectional view of the india rubber cushion, known amongst the billiard table makers as the "pipe" or "tube" cushion. It is composed of a long round strip of rubber, sometimes hollow and sometimes solid, as they wish to increase or diminish the degree of elasticity. The ball, *d*, is represented in contact with it. When the ball comes in contact with the rubber it sinks in, or is embedded in it more or less, according to the degree of force with which it may be impelled; the greater the force the more the rubber is compressed, and the more the ball is embedded, and this sinking

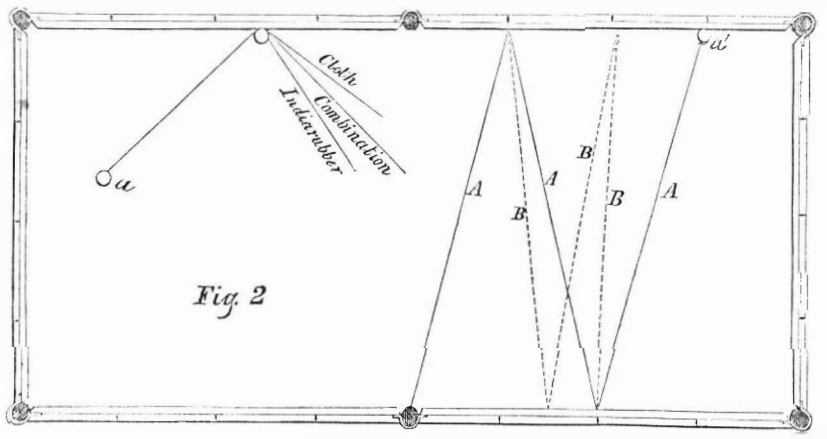
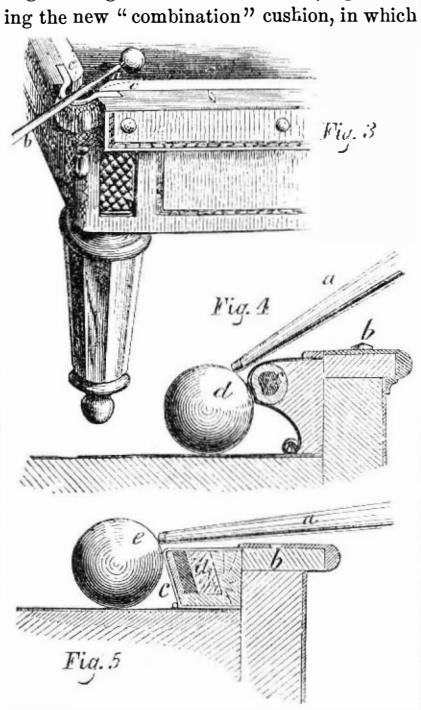


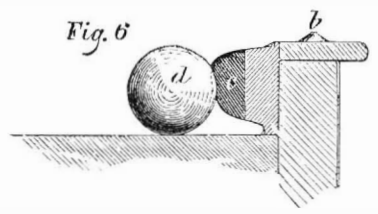
Fig. 2

in or embedding of the ball, together with the extreme elasticity of the rubber is the cause of the angle produced by the rebound, being acute, and so much at variance with correct angles. Fig. 5 is a sectional view, representing the new "combination" cushion, in which



the inventor, after a series of experiments, has succeeded in producing an article in which the objections referred to in the old table are entirely obviated, and in which other important improvements are introduced. The "combination" cushion, that is, the portion of it which causes the rebound of the ball after contact with it, is composed of three different materials, (not including the cloths for covers) by which a cushion elastic at its back and comparatively solid, yet pliable at its face, is produced, thus preventing the ball sinking in, and yet retaining the elasticity of the substance marked *d*. These three substances are of different degrees of elasticity, and are so combined and graduated as to produce angles in accordance with scientific principles. Fig. 6 is a sectional view of another india rubber cushion called the "English pattern." *d* is the ball, *c* the india rubber, and *b* the sight. Some persons engaged in the manufacture of what they call billiard tables are using it, and talk about correct angles without well knowing what they mean. This cushion is simply a strip of rubber of the shape represented; and the same objections exist in this as in the "pipe" or "tube" cushion, viz., an embedding of the ball, and too much elasticity; at all events, the test is the angles, and they are found to give angles at variance with all known geometrical principles. This figure also serves to illustrate the shape of the old-fashioned cloth cushion, composed of long strips or layers of cloth stretched parallel with the cushion rail; they are now nearly out of use, as the "pipe," "tube," and English pattern will be as soon as the advantages of the "combination cushions" become generally known.

Fig. 6



It is a well-known fact among scientific billiard players, that speed and truth cannot be obtained in a cushion. Beyond a certain degree of elasticity in a cushion, the more incorrect it becomes. When we say speed, we mean the ridiculous railroad pace lately brought into use in public billiard rooms, and which meet the approval of those only who are advocates for chance hazards or canon; while to the player who calculates upon, and who is accustomed to geometrical demonstration, it is painful to see the beautiful and scientific properties of the game disgraced.

The "combination cushions" are fast enough for every purpose of scientific play, and by playing on a table constructed as just described a knowledge of the game would be more easily acquired, whilst a greater number of points could be made from the balls; by using them, the proprietors of billiard rooms, would, we think, find players of merit more anxious to contend and test the strength of their games.

More information may be obtained by letter adressed to Mr. Phelan, who is a distinguished billiard player.

Colt's Pistols.

At the trial of Baker in this city, last week, Edward N. Dickerson, attorney and counsellor at law, gave some valuable testimony relative to the manufacture of Colt's pistols. He was at one time a practical mechanic, and is Col. Colt's counsellor. He stated that he was familiar with every part of the manufacture of such pistols. The average number of men employed in Colt's factory at Hartford, Conn., from 1848 till the present time has been about 200. The whole number manufactured up to the 1st of last February, was 200,000. These pistols are all made by machinery, all the parts of one size are alike, and fit one another. The number marked on each is the only way to distinguish one from another. He stated that the expanded gas of the powder rushed out of a pistol with a velocity of 7,000 feet per second.

Explosion of a Steam Fire Engine

The new steam fire engine *Joe Ross*, constructed by A. B. Latta, exploded its boiler on the 6th inst., at Cincinnati, while its powers were being tested. The engineer, John Winterbottom, we are sorry to say, was killed, and a number of others standing around were severely wounded. While the engine was working rapidly the hose-pipe burst; some person called to the engineer to stop the engine, which he did, although not instantly; almost as soon as it stopped working the explosion took place. The steam was at 180 lbs. pressure.

Sugar Crust in Pans.

A correspondent writing from Donaldsville, La., states that one of the greatest troubles experienced in sugar boiling is the crust which forms on the copper worm or pipe in the pan. It takes from three to four hours labor to scrape it off, and during this time the "dunder" in the mill, and the juice should at once, when pressed out of the cane, be run into the boiling pan, become rapidly sour, and entails a considerable loss. If there were any way to keep the steam pipe or worm perfectly free of crust in sugar boiling, so that the expressed cane juice could always be run rapidly into the pan, a great benefit would be conferred on sugar planters.

Death of A. H. Simmons, of the Philadelphia Ledger.

Azariah A. Simmons, one of the proprietors of the *Ledger*, died, after a short illness, on the morning of the 9th inst. He was distinguished for his genial social qualities, strict business integrity and enterprise. In connection with his surviving partners, he, twenty years since, commenced the publication of the first successful penny paper in Philadelphia. The deceased was 49 years of age, a native of Norwich, Conn., and was extensively and favorably known in this and other cities of the Union.

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Scientific American.

NEW-YORK, DECEMBER 22, 1855.

A Candidate for Public Charity.

The owners of the Woodworth Planing Machine patent have reproduced a pamphlet of eighty pages, setting forth the poverty and incapacity of William W. Woodworth, son, heir, and administrator of Woodworth the inventor, and humbly asking the charity of Congress, to save the heir from the poor-house. The real object in view is to procure the perpetuation of their monstrous monopoly, to wit.: the planing of all the lumber produced in the country.

Poor William is made to say in his present memorial, that when the last extension was granted, he was having a terrible time with the lawyers. Suits without number were instigated and carried on by a "combination of wealthy parties, deeply interested in the defeat of this patent, and against whom the *unfortunate* heirs to the estate of an inventor, embarrassed by expenditures to perfect this machine, could oppose but *feeble resistance*." "Your Memorialist and sisters had not the means to litigate them, and they were compelled either to dispose of the term which had thus been granted them by Congress, at the best price they could obtain for it, or to abandon to more wealthy infringers the profits due by law and justice to them." "While these questions were thus pending and thus situated, your Memorialist sold the extended term of said patent for $50,000, in notes payable at long date, &c. At least 25 per cent of this amount was deducted by your Memorialist from the amount so to be received, in order to convert these notes into available means, and your Memorialist was compelled to pay debts of the estate of William Woodworth, deceased, to an amount exceeding $20,000, created by reason of his inventions of the planing machine."

If the foregoing statement is true, Mr. William W. Woodworth must be, by this time, on the verge of poverty. But is he the impoverished alms-seeker that he pretends?

When Woodworth submitted his Memorial to Congress in 1852, his claims were most thoroughly examined by the Committee on Patents. They had power to send for persons and papers. They examined many witnesses, and the conclusion they reached was that Woodworth's representations were, in several important particulars, destitute of truth. Mr. Carter, the chairman of the Committee, in his scorching report, tells us that "when the last grant was given, there remained to the administrator an unexpired term of nearly five years, and the extension then granted for seven years in addition, was equal, *upon his own showing*, to a tribute of three millions per annum, or a direct grant of *twenty-one millions of dollars*. If," continues the report, "he chose to part with this for $50,000 or $100,000 without reserving to himself some further equivalents beyond those which appear upon the face of the recorded papers, it was an act of strange improvidence, with which the Government has nothing to do. If the terms on which he afterwards parted with the re-issued patent were equally unfavorable—and upon that point the Committee have no information—the Government has no share in the responsibility. It neither imposes upon Congress the obligation nor invests them with the right to fasten upon the country, for his benefit, an immense burden of taxation for another term of fourteen years. The Committee, however, are not able to believe that the Memorialist has not profited amply by the precious bounty of Congress. Be that as it may, the debt has been *paid* by the country, and *overpaid* many hundred-fold. The invention of William Woodworth has no claim to further remuneration."

The Committee are not alone in thinking that the Memorialist has been amply profited by the bounty of Congress. It is difficult to believe that the administrator actually sold the entire extension of seven years, for a smaller sum than the patent was then netting in a *single week*. At the rate of $3,000,000 per annum, the profits were fifty-seven thousand dollars a week.

The Woodworth memorial contains several other prominent features that are as wide of the real truth as the one we have discussed. We shall probably allude to them again, and perhaps in a future number republish the whole of the Carter report.—That document is entirely unanswerable by the Woodworth memorialists; we believe they have never made any attempt to refute it; indeed, in their present pamphlet, they attack everything but that.

The Congressional Committee of 1852 effectually silenced them for three years, and unless we greatly misunderstand the signs of the times, the Committee for 1855-6 will silence them forever. But the most desperate efforts are being made, we understand, to subsidize and bring over the Senate, the House of Representatives, and all persons having political influence. The extension, if obtained, will be worth, to the grantees, not less than *seventy millions of dollars!* They can afford to spend a million or two in its obtaining, and they mean to do so. The most vigorous efforts, therefore, must be made to insure their defeat.

Once more we call upon the people to make their sentiments on this subject known through their Representatives. We urge them to act earnestly and with determination. One more vigorous blow and this hydra of wrong and corruption will be laid low in the dust. Petitions adverse to the monopoly can be had by writing to the Scientific American Office. We hope they will be generally circulated, signed, and promptly transmitted to Washington. Those who take charge of memorials must work hard and incessantly. Not a single opportunity for obtaining a name should be omitted. Petitions should be addressed to the Member of Congress representing the district where the petitioners reside.

In our own office we have posted conspicuously a memorial against the extension; it has already received a large number of signatures, but many thousands more are wanted. Walk up, gentlemen, and leave your autographs.

Defects of the Granite Pavement.

Under this head the *Daily Times* of the 13th inst. condemns all the granite pavement in this city. The objections which it has presented against the *large* block pavement, known by the name of "Russ," are correct, but it did not judiciously discriminate between that kind of pavement and the Belgian (how came it to get this name?) or small granite block pavement. The Russ pavement,—the old Roman—is composed of large granite cubes about eighteen inches square, laid on a bed of concrete and cemented in the joints. The first sample of this pavement laid down in this city was in Broadway, about eight years ago, and for a period it gave great satisfaction, because it was such an improvement on the miserable old cobble stone pavement. Large sections of the same and other streets were soon afterwards paved in the same manner. This was while the face of the stones was rough, and afforded a good foothold for horses. About the time it was laid down we pointed out its defects, and stated that when the surface of the blocks became worn and smooth the street would become like a field of smooth steel, and the consequence would be that horses could not travel but with the utmost difficulty on it. This has actually taken place. Another defect pointed out was the difficuly it would always present in obtaining access to sewers, water and gas pipes, owing to its being laid in a bed of hard cement. These evils have now become apparent to all; hence the cry of condemnation has now become somewhat general, and justly so. But why does the *Times* condemn the small granite block pavement as follows?

"The recommendation of the Mayor to the Common Council to groove the Russ pavement is a very sensible one, as far as it goes; but grooves are of but little benefit, as the experience of the grooved and Belgian pavements proves."

What does it mean by saying "the *grooves* are of but little benefit, as the experience of the Belgian pavement proves?" There are no grooves cut in the Belgian pavement blocks, consequently the above is not correct. Grooving the large blocks of the Russ pavement as is done in some of the old cities of Europe, is an expensive and indifferent system. It may do very well for an old city, over whose streets there is but little carriage travel, but it is a system altogether unsuited for Broadway—the hardest traveled street in the world, with the exception, perhaps, of one or two in London. The hard cement between the joints, and the hard bottom of the grooves in large blocks, can never afford a sufficient foothold for the shoes of horses. On the other hand, the small block pavement has soft sandy interstics; the blocks are so small and the joints so numerous that it affords a proper foothold for horses even when the blocks are smooth. What, then, is the objection to it, seeing that it affords an easy access to drains, &c.? It is the best stone pavement, we believe, yet tried by our city, and we hope that mere declamation will not be allowed to lead our city authorities to condemn it.

Porter's Stone Dressing Machine.

Our constant readers will remember the illustrated description of the above machine, which appeared on page 57, volume 10, Scientific American. Since the period of that publication, a Company with a large capital, called the Porter Stone Dressing Machine Co., has been formed in this city, for the purpose of improving and constructing such machines for general use, and we had the pleasure last week of seeing one of their new machines in operation, at their works in Fourteenth street, near the North River. This new machine embraces a number of judicious and excellent improvements. In comparison with the first machine which we saw in operation, its performance was altogether superior. It has been greatly simplified; the number of parts have been reduced, and it is constructed in a most solid and approved manner. It was driven by a neat, but very small steam engine, of 5-horse power, at the rate of 300 strokes per minute, operating four hammers of 450 lbs. each, actuating four sets of cutter's tools in exact line, and which cut a surface of three feet broad on a brown free stone, six feet long, reducing it from a rough to a smooth surface, going over it three times, in a very few minutes. The machine can cut 800 feet of stone per day, from the rough as it comes from the quarry, to a smooth surface, of course changing the tools once from pointed groovers to smoothing or drove chisels for the finishing operation. One good stone cutter can face about sixteen feet of brown stone in a day; this machine, therefore, can do the work of fifty men (800÷16=50.)

Quite a number of stone cutting machines have been invented, both at home and abroad, but it is a remarkable fact that none but Wilson's and this one are in operation in this city. There is something peculiar in the nature of stone cutting, which appears to be very difficult to accomplish successfully by machinery. Stone cutting by hand is a laborious and an expensive operation. At first sight it would really appear as if stones could easily be dressed by huge cutters, driven by that mighty agent "steam," in the same manner as planing timber, as the work is but a repetition of certain defined motions. But the nature of stone is peculiar; it must be struck with the chisel in a peculiar manner, and at a certain angle, or the face of the stone will be bruised and injured, because it is a crystalline, and not a fibrous substance like wood. This has been a great difficulty with stone cutting machines; the wrist of the stone cutter has a peculiar motion given to it while handling his tool.—This wrist motion of the tools is embraced in the stone cutting machine of Mr. Porter, and its principle of operation is the same as that of the hand of the human stone cutter. It therefore produces excellent work, and contains within it the principles of success. It is worthy of a visit to see it in operation, by all who are interested in stone dressing. The Office of the Company is at No. 37 Wall st.; the machine is running daily at their works in 14th street, between 9th and 10th Avenues.

Loughridge's Patent Car Brake.

An interesting trial of this highly important invention took place Dec. 11th, on the Hudson River Railroad, between New York and Sing Sing. The apparatus was attached to a special train of five passenger cars; the ordinary brakes were also in place, but independent. The invention consists in having a chain running beneath the cars, the entire length of the train. Attached to the engine is a reel, on which the chain winds. The reel is put in motion by the engineer, who presses against it by means of a convenient lever, a clutch friction pulley, rotated by the engine. The chain, as it winds up, operates all the brakes simultaneously. The engineer has the most perfect control of the brakes, being able to increase or diminish their pressure by the simple movement of the lever.

Running at 35 miles an hour the train was brought to a stop within 500 feet. At this stage of the experiment, some portion of the apparatus gave way, and the train returned to the city without further exercise, save the following:

The same speed was put upon the train, and the brakemen placed on the *qui vive*, in order to compete with Loughridge. The signal to brake was given, and they instantly did so. The result was, that the cars stopped in as short a distance as when Loughridge's apparatus operated. This proves, we think, that with the common brakes, if properly manned, and the brakemen at their posts, a large proportion of all accidents might be avoided. It also proves the existence of a shocking degree of carelessness on the part of brakemen and other officials in this respect. It likewise proves the great necessity for some invention which shall place the brakes under the instant control of the engineer.

Mr. Loughridge's invention has been before noticed in our columns. It was patented in the United States and Europe through the Scientific American Patent Agency.

New Year's Presents.

In accordance with our custom for several years past, we shall distribute, on the 1st of January next, among our patrons, a number of highly valuable presents. They consist of money prizes, in sums varying from $100 down. These presents will not be distributed by favoritism; they are open to all who choose to apply for them. We simply require that those who seek them shall obtain for us a few subscribers. For more full explanations of the conditions, see prospectus on the last page of this sheet.

New Year's day is close at hand, but there is still an opportunity for the highest success, if vigorous exertion be made. Several lists have been already sent in; some of them are equal, and in others there is only a difference of one or two names. We would suggest to competitors who have already entered, the propriety of further effort. The addition to their lists of even a single name may save them from defeat, or gain a higher prize. Governors have been elected by the cast of a single vote.

Test of the Vergennes Scales.

We witnessed, last week, at the Crystal Palace, a test of one of the platform weighing apparatuses made by the Vergennes (Vermont) Scale Co., (Sampson's patent.) This scale requires no pit, and is portable; can be taken up and moved about from place to place with facility. The scale on trial had a capacity of seven tuns. The test was made with a large chunk of iron weighing two tuns. This was moved about from end to end on the platform, but in no case was there a variation of over two ounces. So accurately adjusted was the apparatus that the addition of a copper cent to the weight made a sensible difference in the movement of the weighing beam!

Subsequently a trial was made before the Committee of Arts and Sciences of the American Institute, when the great railroad scale, 100 feet long, by the same makers, and on the same principle, was submitted to a severe ordeal. A truck containing a dead weight of 31,142 lbs. 8 oz. was placed upon the track and rolled to different points. The greatest difference of weight between any two tests was 10 lbs. This was close shaving for a gross sum of over fifteen tuns. The invention has been before fully described and illustrated in the Scientific American.

At St. Louis, on the 7th, three steamboats were burned at the levee. The loss is estimated at $70,000. The boats were named *Parhenia*, *Twin City*, and *Prairie City*; the fire caught on the first named.

Notwithstanding our admonitions, we continue to receive models without the inventor's names attached. This prevents us from acknowledging their reception.

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British Association for the Advancement of Science.—No. 4.

THEORY OF THE AURORA BOREALIS—Admiral Ross read a paper on this subject. He said:

"It having occurred to me that, if my theory was true, namely, 'that the phenomena of the aurora borealis were occasioned by the action of the sun, when below the pole, on the surrounding masses of colored ice, by its rays being reflected from the points of incidence to clouds above the pole which were before invisible,' the phenomena might be artificially produced; to accomplish this, I placed a powerful lamp to represent the sun, having a lens, at the focal distance of which I placed a rectified terrestrial globe, on which bruised glass, of the various colors we have seen in Baffin's Bay, was placed, to represent the colored icebergs we had seen in that locality, while the space between Greenland and Spitzbergen was left blank, to represent the sea. To represent the clouds above the pole, which were to receive the refracted rays, I applied a hot iron to a sponge; and, by giving the globe a regular diurnal motion, I produced the phenomena vulgarly called "The Merry Dancers," and every other appearance, exactly as seen in the natural sky, while it disappeared as the globe turned, as being the part representing the sea to the points of incidence. In corroboration of my theory, I have to remark that, during my last voyage to the Arctic Regions (1850-1) we never, among the numerous icebergs, saw any that were colored, but all were a yellowish white; and, during the following winter, the aurora was exactly the same color; and, when that part of the globe was covered with bruised glass of that color, the phenomena produced in my experiment was the same, as was, also, the Aurora Australis, in the Antarctic regions, where no colored icebergs were ever seen. I regret that it is out of my power to exhibit the experiments I have described, owing to the peculiar manner in which the room must be darkened, even if I had the necessary apparatus with me; but it is an experiment so simple that it can easily be accomplished by any person interested in the beautiful phenomena of the aurora borealis."

ON OCEAN TELEGRAPH CABLES—By Mr Wildman Whitehouse—After referring to the rapid progress in submarine telegraphy which the last four years have witnessed, Mr. Whitehouse said that he regarded it as an established fact that the nautical and engineering difficulties which at first existed had been already overcome, and that the experience gained in submerging the shorter lengths had enabled the projectors to provide for all contingencies affecting the greater. He then drew the attention to a series of experimental observations which he had made upon the Mediterranean and Newfoundland cables, before they sailed for their respective destinations. These cables contained an aggregate of 1,125 miles of insulated electric wire—and the experiments were conducted chiefly with reference to the problem of the practicability of establishing electric communications with India, Australia, and America. The results of all the experiments were recorded by a steel "style" upon electro-chemical paper by the action of the current itself, while the paper was at the same time divided into seconds and fractional parts of a second by the use of a pendulum. This mode of operating admits of great delicacy in the determination of the results, as the seconds can afterwards be divided into hundredths by the use of a "vernier," and the result read off with the same facility as a barometric observation. Enlarged fac-similes of these electric autographs were exhibited. The well-known effects of induction upon the current were accurately displayed. No less than eight currents—four positive and four negative—were transmitted in a single second of time through the same length of wire (1,125 miles) through which a single current required a second and a half to discharge itself *spontaneously* upon the paper. Having stated the precautions adopted to guard against error in the observations, the details of the experiments were then concisely given, including those for "velocity," which howed a much higher rate attainable by the magneto-electric than by the voltaic current. The author stated his conviction that it appeared from these experiments, as well as from trials which he had made with an instrument of the simplest form, actuated by magneto-electric currents, that the working speed attainable in a submarine wire of 1,125 miles was ample for commercial success. And may we not, he added, fairly conclude also that India, Australia, and America are accessible by telegraph without the use of wires larger than those commonly employed in submarine cables?

ON SOLAR REFRACTION—By Prof. Piazzi Smyth—Amongst other interesting and important consequences of the dynamical theory of heat, Prof. W. Thomson having deduced the necessity of a resisting medium, the condensation of this about the sun, and a consequent refraction of the stars seen in that neighborhood, Prof. Piazzi Smyth had endeavored to ascertain by direct astronomical observation whether any such effect was visible to our best instruments. Owing to atmospheric obstructions, only three observations, yielding two results, had been yet obtained; but both these indicated a sensible amount of solar refraction.—Should this effect be confirmed by more numerous observations it must have important bearings on every branch of astronomy; and as the atmosphere at all ordinary observatories presents almost insuperable obstacles, the author pointed out the advantage of stationing a telescope for this purpose on the summit of a high mountain.

THE INDIA RUBBER TREE AND ITS FRUIT—Chevalier D. Claussen, inventor of the flax cotton, read a paper on the above subject. He stated, that in the course of his travels in South America, he had occasion to examine the different trees which produce the india rubber, and of which the *Hancornia speciosa* is one.—It grows on the high plateaux of South America, between the tenth and twentieth degrees of latitude south, at a hight from three to five thousand feet above the level of the sea. It is of the family of the *Sapotaceæ*, the same to which belongs the tree which produces gutta percha It bears a fruit, in form, not unlike a bergamot pear, and full of a milky juice, which is liquid india rubber. To be eatable, the fruit must be kept two or three weeks after being gathered, in which time all the india rubber disappears, or is converted into sugar, and is then in taste one of the most delicious fruits known, and regarded by the Brazilians (who call it Mangava) as superior to all other fruits of their country. The change of india rubber into sugar, led him to suppose that gutta percha, india rubber, and similar compounds contained starch. He therefore tried to mix it with resinous or oily subtances, in combination with tannin, and succeeded in making compounds which can be mixed in all proportions with gutta percha or india rubber without altering their characters. By the foregoing it will be understood that a great number of compounds of the gutta percha and india rubber class may be formed by mixing starch, gluten, or flour with tannin and resinous or oily substances. By mixing some of these compounds with gutta percha or india rubber, he can so increase its hardness that it will be like horn, and may be used as shields to protect the soldiers from the effect of the Minie balls, and some of these compounds in combination with iron, may be useful in floating batteries and many other purposes, such as the covering the electric telegraph wires, imitation of wood, ship-building, &c.

SOAP PLANTS—The Chevalier also read a paper on this subject. When he was experimenting on several plants for the purpose of discovering fibers for paper pulp, he accidentally treated some common sea weeds with alkalies, and found they were entirely dissolved, and formed a soapy compound which could be employed in the manufacture of soap. The making of soaps directly from sea-weeds must be more advantageous than burning them for the purpose of making kelp, because the fucusoid and glutinous matter they contain are saved and converted into soap. The Brazilians use a malvaceous plant (Sida) for washing instead of soap, and the Chinese use flour of beans in the scouring of their silk; and he had found that not alone sea weed, but also many other glutinous plants, and gluten, may be used in the manufacture of soap.

[This concludes our extracts from some of the papers read before the last meeting of the above-named Association.

Pure and Impure City Water.

MESSRS. EDITORS—In the SCIENTIFIC AMERICAN of the 24th of Nov., I noticed an aticle entitled "Impure City Water," which, without further elucidation, is calculated to detract from the popularity of the gravitation system for supplying towns with water.

As a Commissioner under the English Drainage Acts; as one of the parties conferred with by the Government on the public Health Act; as having taken an active part in the promotion of these important measures; and, moreover, from a tolerably extensive experience, having a practical acquaintance with the most approved modern plans of sanatary works, which have been my special study and professional occupation for some years past, I feel more than an ordinary interest in impressing on the public mind a right appreciation of those more perfect and efficient plans which, after a long and costly probation, have, in England, attained a degree of completeness that it is my object to introduce on this continent.—Wherever it is attainable, even by going many miles for the purpose, there can be no question but that the gravitation system is the one to be adopted for a water supply. It has everything to commend it to public favor—cheapness of first cost, simplicity, durability, uniformity of supply, with the annual charge for repairs and management reduced to the lowest possible point. As compared with a pumping system, in almost every instance, it will save the entire first cost of the work in twenty years—the period over which it is usual to spread the outlay.

With reference to Boston and Albany, where the water is said to have acquired a fishy taste, it seems to me that the several circumstances have been too superficially examined. In the common course of nature it is simply impossible that opposite causes should produce similar effects; and hence the true reason must be looked for in the existence of the same defect in both places. And I am inclined to think that this will be found in an imperfect circulation in the distributing pipes, or technically speaking, in an excess of dead ends, which invariably produce a deleterious effect on the water. I have also known instances in which a fish has, by some means or other, got into the supply pipe, and being killed therein, has impregnated the water for some time. But, supposing the cause to be what is assumed, by the water being impregnated at its source either by animalculæ or weeds, there is a simple and effectual remedy by means of a properly constructed and adjusted screen filter filled with charcoal, &c., at the mouth of the supply pipe.

The low standard of public health, confirmed by the sad experience of daily reality, shows the pressing necessity which exists on this continent for a more stringent attention to sanatary matters; and that would be a wise and beneficent measure which should oblige (if need were) all municipalites to take prompt and efficient steps for the improvement of the public health.

If any evidence were needed beyond what almost every man's individual feelings can bear testimony to of the comfort, and even monetary benefit to be derived from perfect sewerage, and an ample water supply, it can be found in truthful abundance in the periodical reports of the English Registrar General, which, in recording the health of London, distinctly mark, step by step, the progressive advance in the duration of life exactly proportioned to the progress made in the sewerage of the metropolis, and its more perfect supply of water, and consequent general cleanliness.

JOHN H. CHARNOCK.

Drainage and Sanatory Engineer, Hamilton, Canada West, Dec. 4, 1855.

A Fact for Farmers.

Every inch of rain that falls on a roof yields two barrels to every space ten feet square; and seventy-two barrels are yielded by the annual rain in this climate on a similar surface. A barn thirty by forty feet yields annually 864 barrels; this is enough for more than two barrels a day for every day in the year. Many have, however, at least five times that amount of roofing on their dwellings and other buildings, yielding annually more than four thousand barrels of rain water or about twelve barrel sor one hundred and fifty ordinary pailsful daily.—[Ger. Telegraph.

Artificial Manures.

At a meeting of the National Institute, held in Washington, Dec. 3rd, Dr. Gale in the chair, a verbal communication was made by Dr. Breed, of the Patent Office, respecting the poisonous effluvia arising from the decomposition of night soil, &c., and the remedies for the same. These effluvia are a producing cause of disease, and, but for their diffusion, would generate pestilence in all cities. The remedies are simple and of easy application. Paris illustrates this fact; its former condition being such as to attract the attention of the scientific, their labors had resulted in an entire reform of the evil. The need of this reform in American cities and towns was presented, and the products of the process of putrefaction stated with their deleterious effects upon the air and upon walls. Not only does public health require the immediate abolition of this nuisance, but the wants of agriculture second the demand, as thereby an excellent fertilizer might be abundantly and cheaply supplied. It would be necessary so to treat the mass as to retain its most valuable constituent, nitrogen. The modes of so doing were given in detail—showing how to effect the last-mentioned object and likewise complete deodorization and disinfection. The present process of making poudrette in Paris was then described; and, in conclusion, it was shown that the nitrogen of the annual night soil of London and New York is about equal to the nitrogen of the 180,000 tuns of guano annually imported into Great Britain and the United States, and that, if estimated by the cost of nitrogen in guano, it would amount to nearly ten millions of dollars per annum.

Arithmetical Improvement.

MESSRS. EDITORS—Knowing you to be advocates of improvements, whether mechanical or otherwise, I herewith present an improved plan of multiplying mixed numbers, by which one-half of the usual amount of figuring is saved.

Let us take for an example 866 1-8×422 2-3,

866 1-8
422 2-3

1-3 of 866 1-8=288 17-24

2-3 of 866 1-8=577 10-24

866×422= { 1732 / 1732 / 3464

1-8 of 422= 52 6-8

Total amount 366082 4-24

By the old method the two numbers would be reduced to improper fractions, multiplied, and the numerator divided by the denominator, producing the same result, but involving double the figures.

This I consider of great importance, as the multiplication of long mixed numbers by the old process is excessively tedious. Mr. E. Robbins, a practical mathematician of New Haven, Ct., is, I believe, the discoverer of this improvement. WM. Y. BEACH.

Wallingford, Ct., Dec., 1855.

New Shoal near New York Harbor.

Professor A. D. Bache, the able Superintendent of the U. S. Coast Survey, in a letter to the Secretary of the Treasury, dated the 21st ult., says that in the progress of the hydrographic work of the present season, in the vicinity of the Narrows' entrance to New York harbor, by the Coast Survey party, headed by Lieut. Com. T. A. Craven, U. S. N., a shoal spot has been discovered, existing in the main ship channel, located 2,067 yards S. 30 degrees E. from the lighthouse on Staten Island, lying north and south, with a length of 503 yards in that direction, and a breadth of 164 yards from east to west. The soundings show a depth of eighteen feet, at low water. The shoal is composed of sand and shells, or more strictly is a shell bank. The steamer *Baltic* struck on it a few months since, and it was reported that she had struck upon a wreck. Some of the pilots claim to have had a knowledge of the existenc of the shoal, though none of them could give the ranges for it. The Lieutenant and the Superintendent both recommend that a buoy be placed upon it.

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TO CORRESPONDENTS.

J. B. C., of Tenn.—We are awaiting the report of Mr. Copeland on the Cloud Engine. It is true, as you observe, that the great amount of power required to inject the necessary quantity of air for hot-air engines, is the cause, and always will be the cause of their failure.

E. B. F., of Ill.—A centrifugal gun for shooting balls by mechanical force, is not new; such a gun was experimented with in this city about ten years ago. The expense of working such a gun would be greater than to discharge the balls with gunpowder.

G. C. S., of N. Y.—We know nothing of a work called Grier's Mechanic's Calculator.

W. O. G., of Ct.—If you put one coil of pipe around the bottom of your tub, and have it perforated with holes, you can boil your water quicker than by the large coil without perforations. The use of one coil is preferable for the reason that it distributes the heat much better, and prevents the shock attending the letting in of steam in a large volume.

W. V., of N. J.—We can furnish you no information about turning calender rolls used in the manufacture of paper. We do not remember to have published any thing on this subject. Cannot account for the tardy delivery of your paper. It it regularly mailed from our office and ought to get 12 miles in less time than a week, but the Post Office Department is sometimes sadly out of joint in its postal operations.

S. H., of Iowa -The sketches of your method of tightening up bed cords have been examined. We do not remember to have seen the same thing before, although you must bear in mind that applications for such devices are always attended with much doubt, owing to the fact that so much has been done in this line.

application our fee for preparing it would be $25. The patent fee is $20. See circular about model, etc.

W. J. L., of Mass.—The experiment of producing sparks of electricity, accompanied by a crackling noise, by rubbing down a cat's back, is known, we presume, to every one at all familiar with this feline quadruped. It was one of the curiosities of our juvenile days.

J. P. A., of Ga.—Blackie & Son, 117 Fulton st., N. Y., sell "Reid's Horology," which describes the machinery of watch and clock making. The art of polishing steel, silver, and gold cannot be learned but by actual observation. Emery wheels and buff leather wheels are used in polishing, as well as buff and emery straps. The burnishing or finishing operation is performed by a fine agate burnisher.

C. H. R., of Me.—Your arrangement for admitting steam through a puppet valve appears to be new and patentable Should you decide to make an application send us a model.

J. A., of Pa.—Models sent to the Patent Office cannot be permanently withdrawn. The notice to which you allude has reference to models sent to our office, and upon which no applications are made for patents. Yours does not come within this category.

J. C. R., of Mich.—We have paid no attention to the pretensions set up by the reputed discoverer of a new language. The subject is scarcely worth a serious consideration, as it is wholly impracticable.

J. J., of Mich.—We can understand how a log may be made to float, as you have described it, by chaining it to a lighter timber, but that is not an exact disposal of the question.

Phillip Gross, Boonville, Mo., is a cooper and has heard a good deal about a shaving machine driven by one horse power, which costs from $75 to $300. Mr. Gross wishes to hear directly from the manufacturer of suca a machine.

J. C. R., of Pa.—Minie, the inventor and patentee of the celebrated fire-arm which bears his name, is a lieutenant in the French army, and is stationed in command of the fortress of Vincennes, near Paris. He is continually trying experiments for the benefit of his country. His rifle cannot be obtained in this country that we are aware of.

G. H. D., of N. Y.—During the holidays, from Thanksgiving till after New Years, patent business is always slack with us, and but little is generally done at the Patent Office in acting upon cases. It is an excellent time however, for you to presen your several invention, for the papers can be prepared by us this month without any delay. If your friend should come down with his model, you can send your models, with the Government fees—$30 on each—by him, and the papers we will prepare at once, and probably be able to send them for execution by Mr. H. when he returns. Assure Mr. H. that we will prepare his specifications and drawings so that we can execute them at our office while he remains in the city.

L. A. B., of N. Y.—We have examined the sketch and description of your improved wheel for ascending inclines, and we are of the opinion that it embraces patentable features, as we never saw or heard of anything like it, but as to its practicability we are by no means certain. We should doubt somewhat, and yet it may possibly prove to be free from objection. All we can say in regard to it is, that we think it patentable.

J. M. H., of N. H.—A cupping apparatus constructed in the manner proposed by you, could not in our opinion be patented. It is the mere application of the air pump principle to cupping, without involving anything novel in its contrivance. The idea, however, is not new, as the same thing has been done before.

J. O. M., of N. Y.—A cheap and simple water measurer would be a desirable improvement.

L. Q., of Canada—No provision is made in our laws for a foreign subject securing an invention in this country, by a caveat.

P. & Co., of O.—Fairbanks & Co., Broadway, this city, sell two kinds of coin scales—Fromnei's and Allander's—the first is retailed at $4,50, the latter at $1,50, and we perceive no superiority in one over the other.

W. F., of Tenn.—If you put in a good turbine water wheel, you will be able to get more work out of it than from your flutrer wheel. You have plenty of water to get eight horse power out of a good wheel. Any of those illustrated in our columns will answer your purpose.

B. A. A., of Ind.—So far as we can learn, the chief difficulty with the wire fences that have been put up is their miserable construction. Being badly erected, a prejudice has grown up against their use. The expansion and contraction is a small item of disadvantage. Your device for preventing the same is good, and probably patentable.—You must determine as to the propriety of applying for a patent. Water will rise of itself in a pump stalk out of which the air is exhausted, to a hight of thirty-three feet. In pumping, the power spent is in exhausting the air.—The water follows the piston as fast as it rises. For every foot above thirty-three the column of water must be raised bodily, like any other weight, and the power must be in accordance.

W. S. S., of Mass.—It would not be patentable to fit up the interior of a car in the manner you propose. It has been before suggested to us; but aside from this, the mere introduction of saloons or state rooms for sleeping on cars could not be viewed in the light of a patentable invention.

O. F. S., of N. H.—The paper on glycerine made as described, was read before the British Scientific Association, and was taken from the Report of their proceedings. In all likelihood, the steam required must be surcharged—dry steam—not wet steam.

E. H. H., of Ind.—Your governor is what is known as a chronometric governor, and was invented many years ago by a Frenchman, whose name we forget. We have had the same thing submitted to us more than once with in a year or two.

Money received at the SCIENTIFIC AMERICAN Office on account of Patent Office business for the week ending Saturday, Dec. 15, 1855:—

J. S., of Ind., $15; W. P., of Ct., $30; C. G., of Ky., $25; C. B., of Pa., $30; J. H., Jr., of Wis., $25); W. A., of N. Y., $40; J. H. P., of N. Y., $25; E. H., of N. Y., $30; C. G. G., of N. Y., $10; L. B. P., of O., $25; E. T., of Ct., $25; P. McM., of N. Y., $20; S. I. T., of N. Y. $25; J. W. H., of R. I., $55; C. B., of Ind., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Dec. 15:—

L. B. P., of O.; J. W. H., of R. I.; J. S., of Ind.; C. G., of Ky.; J. H. P., of N. Y.; S. I. T., of N. Y.; W. A., of N. Y.; E. T., of Ct.; C. B., of Ind.

Important Items.

BACK NUMBERS AND VOLUMES—The following numbers and volumes of the SCIENTIFIC AMERICAN, are for sale at this office, at the annexed prices:—Volume VI Vol. VII, Vol. IX, and Vol. X, complete. PRICE, *bound*, per Volume, $2,75. Numbers in sheets, complete, $2. Of Volumes IX. and X., we have also about 40 numbers each, not consecutive, which will be sent by mail on receipt of $1.

RECEIPTS—When money is paid at the office for subscription, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgment of the receipt of their funds.

BINDING—We would suggest to those who desire to have their volumes bound, that they had better send their numbers to this office, and have them executed in a uniform style with their previous volumes. Price of binding 75 cents.

Literary Notices.

GILLESPIE'S LAND SURVEYING—Prof. Gillespie, C. E., of Union College, is the author of a new work just published on the above subject, by D. Appleton & Co., of this City. It is a full and able treatise on land surveying, comprising the theory developed from five elementary principles, and the practice with the chain, the compass, the theodolite, the plane-table, &c. It is illustrated with four hundred engravings and a magnetic chart of the United States. While teaching surveying as preliminary to a course of Civil Engineering, he found that none of the books in use suited his purpose, and he was compelled to teach the subject by a combination of familiar lectures on its principles, and as exemplifications of its practice. His notes continually swelled in bulk, and gradually became systematized, until in 1851 a volume embracing a synopsis of them was given to the public, which has been highly prized. The present volume is a full and complete treatise, embracing all contained in his previous work, and does honor to its author for its completeness, and the perspicuity of its demonstrations. The publishers deserve credit for the neatness of the typography, and the general contour of the book—it is well printed, and the matter arranged with great care.

THE KNICKERBOCKER—Old Knick, for this month, is sentimental, practical, historical, graphical, satirical and musical, as usual. It contains a friendly criticism of Longfellow's recent poem "Hiawatha," which has caused and is causing so much criticism, *pro* and *con*, among the literati. "The Last Seige of Jerusalem," by Rachael A. Ackerman, is a fine poem. The Editor's Table smokes cheerfully with a fine feast of wit and humor.

FRANK LESLIE'S ILLUSTRATED NEWSPAPER—This is the name of a new weekly illustrated journal on the plan of the London Illustrated News. It is a newspaper record of all the principal occurrences of the day, the most prominent incidents being pictured to the eye by engravings. In the number before us there is, for example, an interesting printed description of Dr. Kane's exploits in the Polar regions, illustrated by handsome pictures of Arctic scenery. Hare's Spiritual Machinery, as shown by him at the Broadway Tabernacle, during his recent lecture, is also engraved. There are a number of other very interesting engravings. The whole specimen, both in artistic, literary, and typographical appearance, is splendid. Single copies 10 cents; $4 a year. Leslie, publisher, 14 Spruce st., N. Y.

THE COACH MAKER'S MAGAZINE—For December, by C. W. Saladee, of Columbus, Ohio, contains three large plates of illustrations, besides a number of wood cuts.—With this number the first volume is concluded. We are happy to see that Mr. Saladee has been cheered by its success, and that he goes forward with animation in preparing for his next volume.

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☞ All advertisements must be paid for before inserting.

TECHNICAL DICTIONARY—In the English, French, and German Languages; by Messrs. TOLHAUSEN & GARDISSAL, Civil Engineers. Ready (first part,) French, English, German, price $1,31; (second part) English, French, German, price $1,50. These volumes are designed for the general use of Engineers, Artists, Manufacturers, Foremen, Artizans, in short, of all those who, in some way or other, are concerned in Arts and Manufactures. The present work is the key through which the foreign reader may penetrate into a language which he may know but imperfectly; it is the instantaneous translator of the corresponding technical term, or its equivalent, in the three great industrial languages.—For sale at the SCIENTIFIC AMERICAN Office

BREAST WATER WHEELS—For sale, three Wrought iron Under-shot Water Wheels,—one 14 feet diameter and 3 feet wide; the other two about 12 feet diameter and 2 1-2 feet wide. Either can be made into breast or over-shot wheels at little expense. Terms moderate. Apply to E. WHITNEY, New Haven, Ct. 15 6*

THE AGENT for the sale of the English patent right of C. Cornell Brick Making Machine, the most superior machine in use, may be seen, together with the model, at Lovejoy's Hotel, N. Y. Prompt attention given to any communication addressed to the Agent, S. T. MATHEWS, Lovejoy's Hotel. 1*

WANTED—Four or five traveling and stationary agents, to sell patents and machines of several late improved agricultural implements needed by every farmer. For particulars apply to JESSE URMY, Wilmington, Del. 15 2*

IMPORTANT TO INVENTORS.

THE UNDERSIGNED having had TEN years' practical experience in soliciting PATENTS in this and foreign countries, beg to give notice that they continue to offer their services to all who may desire to secure Patents at home or abroad.

Over *three thousand* Letters Patent have been issued, whose papers were prepared at this Office, and on an average *fifteen*, or *one-third* of all the Patents issued each week, are on cases which are prepared at our Agency.

An able corps of Engineers, Examiners, Draughtsmen, and Specification writers are in constant employment, which renders us able to prepare applications on the shortest notice, while the experience of a long practice, and facilities which few others possess, we are able to give the most correct counsels to inventors in regard to the patentability of inventions placed before us for examination.

Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps towards making an application.

In addition to the advantages which the long experience and great success of our firm in obtaining patents present to inventors, they are informed that all inventions patented through our establishment, are noticed, *at the proper time*, in the SCIENTIFIC AMERICAN. This paper is read by not less than 100,000 persons every week, and enjoys a very wide spread and substantial influence.

Most of the patents obtained by Americans in foreign countries are secured through us, while it is well known that a very large proportion of all the patents applied for in the U. S., go through our agency.

MUNN & CO.

American and Foreign Patent Attornies, 128 Fulton street, New York; 32 Essex Strand, London; 29 Boulevard St. Martin, Paris; No. 3 Rue Theresienne, Brussels.

ALARM ATTACHMENT LOCK—Patented May, 1855—This Lock is manufactured in Rochester, N. Y., by the patentee himself, and under his own directions, and is suitable for Trunks, Doors, Iron Safes, or any other place where a lock is needed—is made in the very best style and workmanlike manner—is perfectly safe to the owner, but rather dangerous for the thief. Responsible Agents are wanted for the sale of the same; and also the right in the United States. Any body wishing to invest capital in a profitable business, will do well to apply, by mail or otherwise, to Messrs. SCHNEIDER & SCHUBERS, Globe Building, Rochester, N. Y. 1*

MECHANICS' TOOLS—For cooperr, house and ship carpenters, millwrights, coachmakers, blacksmiths, and miners. Also drilling, morticing, and boring machines; turning lathes, ratchet, and hand drills, Spear & Jackson's pit, mill, cross-cut, hand, and back saws, and a full assortment of founders and machinists' hardware. Files, screws, rivets, nuts, washers, &c. &c., for sale by CHAS. S. LITTLE, 33 and 34 Fulton st., N. Y. 1*

THREE GOOD JOURNALS FOR 1856!—Well adapted to all readers in every family. LIFE ILLUSTRATED—a First-class Family Paper, devoted to News, Literature, Science, the Arts; to Entertainment, Improvement, and Progress. Published weekly at $2 a year.

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PROF. ROBERT HARE'S Great Book—with engravings illustrating the Dr's. ingenious mechanical inventions to detect deception, and scientifically demonstrate the true agent involved in the so-called spiritual manifestations. Price $1,75, postage 25 cents, just published by PARTRIDGE & BRITTAN, fronting the Tabernacle, No. 342 Broadway, N. Y. 14 2*

RAILROAD SHUTTERS FOR STORES—An improvement in the above line was patented August 28th, 1855. Those wishing to use this improvement can be accommodated on reasonable terms by applying to the patentee and manufacturer, D. ROHAN, No. 7 Jackson st., Cincinnati, Ohio. 14 4*

WE HAVE ALWAYS ON HAND and manufacture to order, with the newest and most practical improvements, Surveyor's Compasses, Transits, Theodolites, &c., warranted to give satisfaction. Also Swiss drawing instruments. Catalogues gratis on application. AMSLER & WIRZ, 211 Chestnut st., Philadelphia. 14 6eow

1855-6.—WOODWORTH'S PATENT Planing, Tonguing and Grooving Machines.—The subscriber is constantly manufacturing, and has now for sale the best assortment of these unrivalled machines to be found in the United States. Prices from $45 to $1450. Rights for sale in all the unoccupied Towns in New York and Northern Pennsylvania, JOHN GIBSON, Planing Mills, Albany, N. Y. 14 3m*

SAMUEL D. BARNETT, Malleable and Gray Iron Works Hamilton, corner McWhorter street, Newark, N. J. Orders promptly attended to. 9 10*

JAQUARD MACHINES—With Harness complete and ready to receive the warps, built on the most improved plan, for the manufacturing of Figured Goods of every description. Also Ribbon Looms and Card Punching Machines made to order.

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CIRCULAR SAWS—We respectfully call the attention of manufacturers of lumber to the great improvements recently introduced in the manufacture of our Circular Saws. Being sole proprietors of Southwell's patent for grinding saws, we are enabled to grind circular saws from six inches to six feet with the greatest accuracy and precision. The impossibility of grinding a saw without leaving it uneven in thickness has always been acknowledged by practical saw makers. This causes the saw to expand as soon as it becomes slightly heated in working. When this takes place the saw loses its stiffness, and will not cut in a direct line. We will warrant our saws to be free from these defects; they are made perfectly even in thickness, or gradually increase in thickness from the edge to the center, as may be desired. As there are no thick or thin places, the friction on the surface of the saw is uniform, consequently it will remain stiff and true, and will require less set and less power. Will saw smooth, save lumber, and will not be liable to become untrue. This is the oldest establishment now in existence for the manufacture of circular saws in the United States, having been established in the year 1830. Orders received at our Warehouse, No. 48 Congress st., Boston.

12 3m* WELCH & GRIFFITHS.

H. WELLS, & CO., Florence, Hampshire Co., Mass. will furnish to order, Morrison's Patent Shingle Machines. This is the only machine extant that will rive with the grain of the wood, and produce perfect shaved and jointed shingles. The machine will work any kind of timber that can be worked by hand, and will make 25,000 shingles in 10 hours regardless of width, with 4-horse power. Child's Circular Saw Mills constantly on hand. 11 6eow*

PORTABLE STEAM ENGINES.—S. C. HILLS, No. 12 Platt st., N. Y., offers for sale these Engines, with Boilers, Pumps, Heaters, etc., all complete, and very compact, from 2 to 10 horse power, suitable for printers, carpenters, farmers, planters, &c. A 2 1-2 horse can be seen in store, it occupies a space 5 by 3 feet, weighs 1500 lbs., price $240, other sizes in proportion. 3 e3w

NOTICE TO PLOW MANUFACTURERS.—JOSHUA GIBBS, of Canton, O., has invented a machine for Grinding and Polishing plows. By addressing the patentee, a cut and directions for making and using will be forwarded; also the term of three months will be granted to test its utility and advantages. Cost for erecting the machine will not exceed $15. 12 8*

OIL SAVER—Save 75 per cent of your oil by using Devlan, Wood, & Hancock's Patent Oil Saver. For particulars and right to use in machine shops, factories, &c., and on railroads, apply to S. C. HILLS, 12 Platt st., New York. 12 10

VAIL'S CELEBRATED PORTABLE STEAM Engines and Saw Mills, Bogardus' Horsepowers, Smut Machines, Saw and Grist Mill irons and Gearing, Saw Gummers, Ratchet Drills, &c. Orders for light and heavy forging and castings executed with dispatch.

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IMPORTANT INVENTION—Patented August 14th, 1855. "Garratt's Metal" for Journal Boxes of all kinds, it is anti-friction, absorbs the oil, not liable to break, it can be made cheaper than either brass or Babbitt metal, and after many long and severe tests, has been found to surpass all other metals ever used for the purpose. For the purchase of either State, county, or shop rights under this patent, apply to JOS. GARRATT, Senr., Madison, Indiana. 133m*

$500 TO $10,000—GREAT INVESTMENT.—Any person desirous of investing a large or small amount in a patent right, that the profits of which will clear the whole cost in one month's sales. Can find an opportunity by addressing Box 2,627 this city. 14 4*

MACHINISTS' TOOLS.—Meriden Machine Co have on hand at their New York Office, 15 Gold street, a great variety of Machinists' Tools, Hand and Power Punching Presses, Forcing Pumps, Machine Belting, &c., all of the best quality. Factory West Meriden, Conn. 2 13*

W. P. N. FITZGERALD, Counsellor at Law—late Principal Examiner in the U. S. Patent Office—has removed from Washington, D. C. to the city of New York, 271 Broadway, (corner of Chambers St.) As heretofore, his practice is confined to Patent Cases, which he will prosecute or defend, as counsel, before the Supreme and Circuit Courts of the United States, also before the Patent Office, or the Judges having jurisdiction of appeals therefrom. 11tf

WATER POWER FOR SALE—8 hours' ride from the city of New York, near the beautiful and thriving village of Owego, on the New York and Erie Railroad. The wheel is 14 feet diameter, 5 foot bucket, building 75 by 25, two stories high. For particulars apply to HARVEY CHURCH, Troy, N. Y., or H. H. NASH, Owego, N. Y. 8 8*

MACHINISTS, TOOLS—Manufacturers, Mechanics and Railroad Supplies, Locomotive and Stationary Engines, Ashcroft's Steam Gauges, Pollers, Trip Hammers, Belting, Cotton and Woolen Machinery, Water Wheels, Pumps, Blowers, Wrought Iron Tackle Blocks, &c. FOSTER & LEACH,
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OIL! OIL! OIL!—For railroads, steamers, and for machinery and burning—Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturer.

F. S. PEASE, 61 Main st., Buffalo, N. Y.

N. B.—Reliable orders filled for any part of the United States and Europe. 4tf

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4 Sun Office, N. Y.

THE NEW YORK DAILY SUN—Is forwarded by the early mails to country subscribers at $4 per annum, or $1 per quarter, payable in advance. The postage under the present law is as follows: to any postoffice in the State of New York, 78 cents per year, payable quarterly in advance. Out of New York State, but within the United States, $1,56 per year, payable quarterly in advance. MOSES S. BEACH, Publisher,
4 Corner of Fulton and Nassau sts.

IMPORTANT TO ENGINEERS AND MACHINISTS—NOTICE—Those wishing to obtain the genuine articles of Metallic Oil and Grease, should send their orders direct to the manufacturer, AUGUSTUS YOCKNEY, Office 67 Exchange Place, New York. No Agents employed. 1 6m*

NORCROSS ROTARY PLANING MACHINE.—The Supreme Court of the U. S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb. 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks is not an infringement of the Woodworth Patent.

Rights to use the N. G. Norcross's patented machine can be purchased on application to N. G. NORCROSS, 208 Broadway, New York.

Office for sale of rights at 208 Broadway, New York. Boston, 27 State street, and Lowell, Mass. 42 6m*

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Science and Art.

Purifying Cotton Seed for the Manufacture of Oil and Oil Cake.

Heretofore the efforts made to render the seed of the cotton plant available for the production of oil, or for the purpose of feeding man or domestic animals, have not been productive of perfect results, owing to the nature of the shell, by which the kernel of the seed is enclosed, as some fibers of the cotton adhere to it, and both the shell and the fibers of cotton absorb a considerable portion of the oil, and also render the cake unsuitable for feeding purposes. On the 24th of July last, a patent was granted to Daniel W. Messer, of Boston, Mass., for an improvement in preparing cotton seed, having for its object the removal of the above evils. The nature of this improvement consists in the separation of the shell of the seed from the kernel, previous to expressing the oil, by which a greater quantity of oil is obtained from the same amount of seed, whilst the residuum, or oil cake, is left free from shell and cotton fiber, and is therefore rendered much superior for feeding cattle. This he accomplishes as follows:—

The shell of the cotton seed is first softened by soaking it in water, or by subjecting it to the action of low steam. When boiling water is employed, about five minutes' immersion of the seed in it is sufficient; when cold water is employed, a much longer time is necessary; and the time required to soften different varieties of seed, varies with the amount of moisture in the seed. After the seed is thus softened, it is passed through proper rollers, or subjected to gentle pressure in a press in small quantities. By this means the shell is broken, and the kernel is forced out. Both the kernels and shells of the seed are then dried in the sun, or by very low artificial heat. If the oil is to be used for culinary purposes, great care must be taken not to dry the kernels under a high heat. When dry, the kernels and seeds are separated from one another by sieves, and the oil is then expressed from the clear kernels by passing them between revolving pressure rollers, or any suitable oil pressing mill. The residuum, or skin, of the pure kernels form beautiful oil-cakes for feeding cattle. The subjecting of the cotton seed to soften it, then afterwards separating the kernels perfectly free from the shell for the purpose described, constitutes the invention of Mr. Messer, and it appears to be one of importance to our cotton planters.

Power of Steam under Great Pressure.

It has been remarked by very able chemists that gunpowder is one thousand times denser than the atmosphere. If, therefore, one thousand cubic inches of atmosphere were compressed into one inch, the one inch will be of the same strength as one cubic inch of gunpowder. Steam possesses about one-half the gravity (or weight) of the atmosphere; therefore, if 1,728 inches of steam, which can be generated from one single cubic inch of water, were compressed into one inch, it would become nearly twice the strength of one cubic inch of gunpowder. This fact will illustrate the great expansive force of steam. From these data approximately, according to the size, contents, and area of the boiler, its explosive power may be estimated; therefore we need not be surprised that those results ensue wherein tuns weight of material are driven to great distances by the explosions of steam boilers.

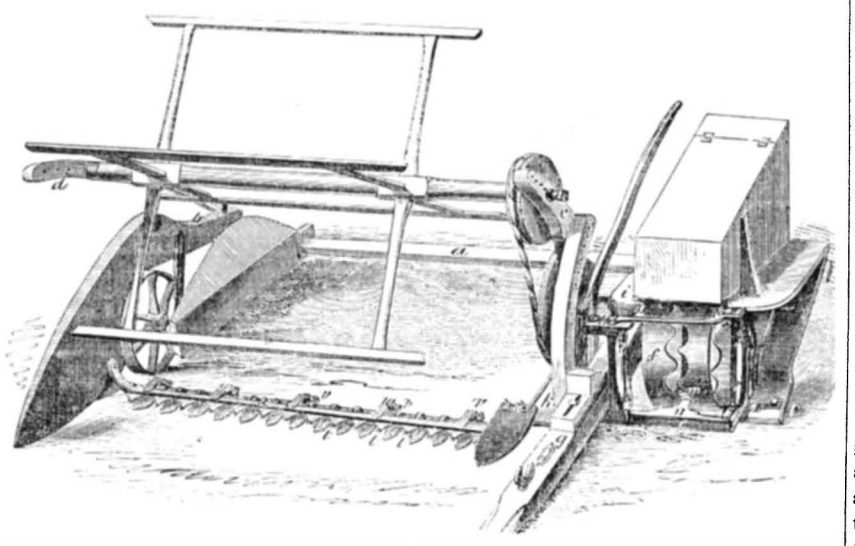
Fumigating Paper.

There are two modes of preparing this article:—First, take sheets of light cartridge paper, and dip them into a solution of alum; say, alum one ounce; water, one pint. After they are thoroughly moistened, let them be well dried. Upon one side of this paper spread a mixture of equal parts of gum benzoin and balm of tolu; or the benzoin may be used alone. To spread the gum and balm, it is necessary that they should be melted in an earthenware vessel, and poured thinly over the paper. Finally, the surface is smoothed with a hot spatula or iron. When required for use, slips of this paper are held over a candle, so as to evaporate the odorous matter, but not to ignite. The alum in the paper prevents it, to a certain extent, from burning.

Second, sheets of good light paper are to be steeped in a solution of saltpeter, in the proportion of two ounces of the saltpeter to one pint of water; to be afterwards thoroughly dried. Gum benzoin and tolu, alone or together, are to be dissolved, to saturation, in rectified spirit or pale brandy, and with a brush spread upon the paper, which, being hung up, rapidly dries. Slips of this paper, rolled up as spills, are to be ignited and then blown out; the saltpeter in the paper causes a slow combustion to continue, diffusing, during that time, the agreeable perfume of the odoriferous gums.

If two of these sheets of paper be pressed together, before the surface is dry, they will join and become as one. When cut into slips, they form what are called "Odoriferous Lighters."—[S. Piesse's Art of Perfumery.

HEATH'S PATENT REAPER.



This figure is a perspective view of a reaper illustrating the improvements for which a patent has been granted to John E. Heath, assignor to Henderson & Caryl, Sandusky, Ohio.

The nature of the improvements consist in the manner of suspending the cutter-bar by stirrups near the ground, in front or behind the driving-wheel, and in or near the same plane as the finger-board, in combination with an angular friction roller whereby the stability of the machine is increased and its draft diminished. It also consists in having an adjustable cutter-bar to regulate the pressure between the cutters and reaper, as may be desired.

a is a wooden back piece and *b* is a wooden side piece; *c* and *d* are cross pieces, securely fastened to an iron front piece, *e*, which extends across the whole width of the machine. There are standards rising from the cross pieces, *c d*, in which are placed the bearings of the axle or shaft of the driving wheel, *f*. The end of the tongue, *g*, is hinged to the standard on the piece *c*. On the top of the arm, *i*, an upright lever has its fulcrum pin. It projects upwards from the tongue, *g*, and has its forward end hinged to a strong staple, *n*, which rises from the front piece, *e*. The tongue passes through this staple, which is sufficiently high to allow the lever to elevate the front part of the machine over any obstacle, or over the cut grass when turning. Upon the tongue, *g*, in front of the staple is placed a gauge block, *k*, attached by a screw in a slot. This block serves to adjust the hight of the cutters according to the hight of the team or nature of the ground. A slit is formed in the periphery of the driving wheel, *f*, of such a form as to give a rapid reciprocating motion to the friction roller, *m*, when the machine is in motion. This roller plays loosely upon an arm projecting upwards and backwards at an angle of about 45 degrees from the horizontal cutter bar, *n*, which is suspended from the top of two standards by the hinged stirrups, *g* and *r*. By this arrangement, the friction of the cutter bar is reduced to a minimum, and run very near the ground. The power being transmitted from the driving wheel near its point of contact with the ground increases the stability of the machine and diminishes its draft. Upon the upper side of the cutter bar, *n*, are bolted the separate cutting teeth, *t*. These are placed close together and their cutting edges are beveled on their upper side—meeting at an acute angle in front. The fingers, *u*, are also made separate, and in a T form, with points in front. The portions which are opposed to the cutting edges of the teeth, *t*, are beveled on the under side and ground sharp. The rear portions of the fingers are of the same thickness as the cutter bar, *n*, and being firmly secured on the front half of the width of the front piece, *o*, form a rebate in which the cutter bar traverses. From the rear of the front piece, *e*, there project horizontal pieces, *r*, to which bent pieces or jacks, *w*, are secured by set screws. These jacks are connected by their forward extremities to an adjustable pressure bar, *x*, which bears upon the upper sides of the teeth, *t*, its front corresponding with the point of junction of the cutting edges of the teeth. This bar, with the jacks and set screws, serves to regulate the pressure between the cutters and fingers, as may be desirable. The rod is supported on the frame, and is rotated by a cord passing over a pulley on the driving shaft and another on the axis of the reel.

Messrs. Henderson & Caryl have manufactured a great number of these machines, and have been very successful in so doing, as they assure us that not one of them has yet been returned for repairs. They are now busy making about 1,500, to have them ready for the spring and summer sales. Mr. Heath has obtained several patents on harvesters, but this one embraces his most recent improvements.

More information relating to the sale and manufacture of these machines may be obtained by letter addressed to D. C. Henderson & Co., Sandusky, Ohio.

Quartz Ware.

The *Mount Alexander Mail*, Australia, states "that a miner at that place named Thomas Golightly, is about to apply for a patent for a process he has invented of obtaining castings of quartz resembling Chinaware in transparency. By chemical experiment, he has ascertained that the mineral may be fused and cast into any required shape. Of course, if this be true, it will no longer be necessary to crush it in order to wash out the gold from the fragments, for by simply melting it, the gold may be separated more easily, and to do this Mr. Golightly has invented a process. The quartz being melted, the casting into ware is intended to be then performed without the necessity of a melting for that especial purpose. Besides the transparency mentioned, the quartz ware would, it is said, equal in whiteness the purest alabaster. Such an invention would, of course, be of the greatest value to both Australia and California, and should it próve practical, the manufacture of quartz ware would probably soon become one of the most important branches of industry in both regions."

[We cannot discover anything new in the above alleged discovery. Quartz can be cast, and is now cast into a variety of forms,—cast glass articles for example.

Great Feat in Ascending an Inclined Rope.

An Italian named Signor Caroni, and his wife, both beyond middle age, recently walked on tight ropes from the ground to the top of a four-story building, in San Francisco. The hight was 64 feet, and the length of rope 175 feet. The ropes were an inch and a quarter in diameter, placed three feet apart, and steadied by guys. The feat was performed with ease in the presence of a large crowd of spectators.

The Dhoora or Indian Millet.

This plant bears a small kind of grain, much cultivated and extensively consumed in India and Egypt, and the interior of Africa; it is quite equal in nutritive value to the average of English wheats, and yields a beautiful white flour. Prof. Johnston, recently deceased, analyzed it, and found that it contained 11 1-4 per cent. of gluten. Now, since gluten is the chief nutritive ingredient of all our grains, this comparison of the Professor exhibits, at once, a nutritive value for the Dhoora that surpasses some of the richest grains in use for the food of man or stock.

Some of this grain has been raised this year by Major R. A. Griffin, of Abbeville, S. C., and it has proven to be a valuable crop, as we learn by the Abbeville *Banner*. He planted it some time in April, four feet in the row, and fifteen inches in the drill, depositing five or six grains in a hill. He afterwards thinned down to one stalk, transplanting to hills that were deficient. This thinning is necessary, from the strong tendency of the plant to sucker and spread. The soil, such as would be selected for common corn, should be properly prepared and manured before planting; the yield is from 80 to 100 bushels per acre.

Extending his experiments recently to the green stalk of the Dhoora, Major G. discovered a cause of its being so much relished by stock, and its singular fattening effects, in addition to the excellent qualities of its grain. He found, on chewing the stalk, which he perceived was consumed in this way by the stock, that it was exceedingly rich in cane juice—but little inferior to the sugar cane itself.

During the last month, the Illinois Central Railroad Company has sold land to the amount of one million one hundred thousand dollars—nineteen-twentieths of which has gone into the hands of actual settlers.

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